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JOURNAL OF THE WEST-RIDING CONSOLIDATED NATURALISTS'

SOCIETY, AND MANUAL OF EXCHANGE IN ALL

DEPARTMENTS OF NATURAL HISTORY.

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THE NATURALIST.

"Labor Omnia Vincit."

Original Articles.

CONSIDERATIONS ON "*SPECIES*" APROPOS OF A NEW WORK BY M. JORDAN.

BY FRANÇOIS CREPIN,

Professor of Botany in the Horticultural School at Ghent.

It remains now to decide,—and this is the chief point in this discussion,—whether the modern school, by means of its criterion, has indicated the true unity or species. If such be the case, we,—Linneans,—must acknowledge that what we have taken for species are in reality generic groups; and that the true species are infinitely more numerous than we had thought; that their affinities are in general very close; and that they are only distinguished from one another by very subtle differences. Granting for the moment that this is the case, let us examine the perturbations which would result from the new point of view from which the species must be judged. All our descriptive works must be re-written,—this is easily understood,—and the great majority of our *Phytographers* and our amateurs would have to begin their studies anew. Alas, what labour, what study! By a single stroke, we find ourselves face to face with a chaos almost equal to that which our *Floras* presented when Linneus at first set himself to work. The *Flora* of Europe includes from 8000 to 9000 types, called linnean, (we only speak of the vascular plants); now these 8000 or 9000 must be dismembered into 50,000 or 60,000 new species, if M. Jordan's principles are applied to them. We say 50,000 to 60,000, but we should not be surprised to see them mount up to 100,000! Some 10,000 types more would make litle difference to good workers, if these legions of species could be distinguished by more or less appreciable characters; but unfortunately, their delineation and limitation would be often a work of incredible difficulty. Ordinarily, they could only

be distinguished by differences so minute and so fugitive, that it would be requisite, before they could be recognised, to study and compare them in the living subject, and oftentimes to examine them when under cultivation. In a dried state it would be almost impossible to determine them. This is the opinion of M. Jordan himself.—"But the study of the *Thlaspi* from herbaria is very difficult on account of the variations which the characters drawn from the silicule occasionally present, according to the season and the unequal development of individuals, particularly in length, the separation of the lobes from the *sinus*, as well as the length of the style, which is more or less salient according to the state of the *sinus*."[8] Even when under cultivation, the study of these new species is surronnded with difficulties, witness again the author of the "Diagnoses":—"The leaves of the different species of *Erophila* ought always to be examined on young plants, before the appearance of the flowers,—in autumn or the end of winter, when they have not suffered from frost. The leaves which remain on the fully developed plant, are generally very little characteristic, either in form or colour."[9] In speaking of the new types, derived from *Papaver Rhœas*, he also says:—"The characters ought always to be studied on individuals which have passed through winter, and which are in a sufficiently normal state, rather luxuriant than otherwise. In poor plants, the characters do not disappear, but they are less striking, and the characteristic *facies* of the plant almost entirely fails, which causes the specific form of the plant to be disguised, to those who are not previously familiar with such studies. The same remark may be applied to many other groups somewhat numerous in annual species, as *Viola* sect. *Melanium*, *Erophila*, &c., which should always be studied from the finest individuals,—those in which the development is very complete and normal."[10]

Having studied these closely allied forms in the living state and under cultivation, there still remains the difficulty of identifying them. And what labour is required in this identification! We request all who have sufficient curiosity to search in nature for the species described by M. Jordan. How many have succeeded, after immense labour, in identifying any of these new forms? Consult any *herbarium* and you will find that nearly all the forms given with a synonym of M. Jordan have their specific name followed by the sign (?). We cannot be sure of their authenticity unless the master himself has named them.

(8) Loc. cit., p. 269. (9) Loc. cit., p. 207.
(10) Loc. cit., p. 100.

In the present state of science, when a *great number of new species* have yet to be named, how can we avoid being constantly in doubt. The plant, tolerably fresh and complete, which we hold in our hand, seems by the majority of its characters to correspond to such and such a description, but a neighbouring diagnosis does not fit it badly. Which of the two shall we refer it to? Is our plant an undescribed species? What means shall we resort to, to determine it? We can, it is true, compare our form with authentic specimens of all the allied forms already described, but we know that dried specimens are not always satisfactory. To be perfectly sure that our determination is correct, we must cultivate our plant alongside all the allied forms already known. This method of identification would be impracticable for the greater proportion of Botanists, and this being the case, we may perceive what a terrible weeding-out would be required in our science after a few years. It is evident that M. Jordan and his disciples have hitherto only named but a very small number of the new species existing in Europe. An unlimited number of forms still remain to be recognised and limited. Suppose the Germans, the Swedes, the English, and the Italians, all at work with the ideas of the French reformer, and see them engaged in the struggle with the Diagnoses already published. Their identifications being very often impossible; the multitude of new species which would immediately see light, would have double and triple meanings. How acute a man would be required in after days to elucidate the synonymy! Indeed he would never find himself,—it would be utterly impossible after what we have stated above. We can see a most frightful chaos if M. Jordan and his school should eventually triumph. The insurmountable difficulties which would surround the determination of species would cause the study of plants to be abandoned by the multitude of amateurs. We should only meet with rare and obstinate workers, who would have the courage to approach some genera. The complete study of the *flora* of a small country would require several lives. In schools where botany is taught, both pupils and professors, finding themselves forced to keep to the study of the ancient types, would be obliged to rest content with the genera, which are formed by the dismembered types.

Another inconvenience of the progress of the new school would be the abandonment for many years of the study of botanical geography. There is no necessity to give any reason for this: it will at once strike the mind of any one who reflects upon it.

We see then to what we should be led, if the principles of M. Jordan

were accepted; but these considerations do not stop him for a moment. Believing that he is in the right, he goes straight ahead without troubling himself about the perturbations which must ensue.

If we raise our voice against him, it is because we fear that the new school is following a false track, a track in which we are afraid of seeing a whole generation lost. Possibly there is no occasion for so much alarm—perhaps we ourselves are in error. Nevertheless, in spite of the assurances of our antagonists, we shall hold fast to the old ideas, properly interpreted. Our own observations of Nature, and experiments in cultivation, still lead us to believe that the *true species are not those of the new school; that the species of nature is something sufficiently well marked out, provided with characters which are in general easily appreciable, that it varies within certain limits, that between these limits it produces varieties which accommodate themselves to the medium in which they live, that some types are more pliable (flexible) than others, but that all are confined within certain limits over which they cannot pass.* These are the ideas that have guided us in all our studies—we might almost call them our creed. A different idea, and another creed rule the researches of M. Jordan. Being a man of good faith and convinced of his principles, as we believe him, we must respect his method of observation. Spite of an antagonism of no new date, we cannot refuse to admire his talent, which is incontestable. No one ever has possessed, like him, the indefatigable ardour, which he has shewn during five-and-twenty years, in analysing this multitude of forms, neglected before his time, and in following them day by day under cultivation. All those who know what extraordinary labour is required in this class of studies, will most certainly render due homage to the Botanist of Lyons. Still it is to be regretted that the prodigious labours which he is engaged in contemplating, do not rest on a more solid basis.

In reading the preface to his "Diagnoses,"—a most remarkable production—we are almost led to embrace his doctrines, so close is his reasoning, so ably are his arguments drawn up. But the premises of this eloquent demonstration, are, we will not say radically false, but extremely doubtful. From the moment his basis is laid open to doubt, we cannot admit his deductions as certainly established. An edifice with such a foundation does not promise a long duration. We much fear that it will give way, but its ruins will furnish us with excellent materials for building another, materials which might otherwise have long been wanting. Indeed, amongst a multitude of very bad species—at least bad in our eyes—we may

say there are many which are excellent according to our views, and which have been neglected in consequence of the indolence of the Linnean school. These riches, acquired by the indefatigable researches of the leader of the new school in France, do not, however, constitute the chief title to this glory: what raises him most is the influence which he has exercised, and still exercises on science. It is he who has roused the old school from its torpor. We may reckon many able observers before him, but the mass of descriptive botanists have followed a routine, which required but very superficial labour. In their books, they have contented themselves with identifying, more or less correctly, the old types, distinguishing them by a small number of sufficiently striking characters, and neglecting the numerous forms which are derived or seem to be derived from these types. There were no experiments, no real criticism. He has rudely shook the routinists—has shewn them what analysis should be,—and lastly he has brought his experiments to bear. To all he says—you admit that persistence of characters is the best mark of species: very well; but I have made long continued experiments and on a large scale, and I find that what you took for specific characters are really characters of a higher order, and that all your pretended varieties are really good and legitimate species, marked by excellent characters which are invariably persistent. What could the old school answer to such categorical language? They were completely taken aback: they had no positive experiments to oppose against those of the reformer. They did answer, it is true, but only with simple speculative ideas, with hypotheses but not with facts, which are everything in the experimental sciences. A certain number of serious observers rallied round the ideas of the new master, and became his disciples, but many others, detecting what was fallacious in his doctrines. did not join his ranks. Having confidence in the old method of observation, they betook themselves courageously to their studies afresh, reconsidered their previous observations, and followed the example set by M. Jordan; they studied the forms they had hitherto neglected and experimented on a number of them. These first and more profound studies have not modified their ideas as to what constitutes a species: on the contrary, they are led to enforce them, and give them a more solid basis. The final result of their efforts will be to make us understand better what is a veritable species. Yet without M. Jordan they would have still gone on a long time in the paths of routine, and unintelligible labours.

Observations.

Eupithecia pulchellata, "Bred."—I am sure it will interest many readers of the "Naturalist" to hear that I have this day bred *E. pulchellata* from larvæ gathered last summer, which fed upon the stamens of the Fox-glove flowers; thus proving, beyond cavil, that our friend Mr. Hodgkinson's suspicions that this long-sought larvæ would be found attached to *Digitalis purpurea* were correct. The larvæ were plentiful in July.—S. Gregson.—*April 12th*, 1865.

A Curious Trout.—At a meeting of the Richmond and North Riding Naturalist's' Field Club, on Tuesday evening last, a somewhat interesting specimen of the trout family was exhibited by Lonsdale Bradley, Esq., F.G.S. This trout was taken on the 8th March from a spring on Hurst Moor, upwards of 1000 feet above the level of the sea, and was a well-fed fish, and in excellent condition, weighing 2 lbs., which is very remarkable considering the severity of the winter. On removing the skin it exhibited a beautiful orange pink colour, deeper than the salmon or bull trout *(Salmo eriox)* of this country, and resembled more the colour of the red mullet *(Mullus barbatus)*, which is a singular circumstance, as the trouts in the rivers and brooks of this neighbourhood are invariably white, and only very seldom tinged with pink. It is supposed to be the red trout of Norway, brought over to this country by some fish-eating bird which had been induced to stop at this spring for food or water on its flight across the island. —Communicated by J. Aspdin, Richmond.

Exchange.

To Entomologists.—Mr. J. Brown, King's Parade, Cambridge, would be glad of larvæ of any species of Lepidoptera, (except the very common.) In return Mr. Brown will be happy to send larvæ or imagos of local species, or repay postage.

Gagea lutea.—Having a number of specimens of *Gagea lutea*, I should be very glad to exchange with any botanist who wishes. Persons wishing to exchange would oblige by mentioning species they may have in duplicate.—J. M. Hick, Rev. B. C. Caffin's, South Street, Durham.

Original Articles.

MATERIALS FOR A FLORA OF WAKEFIELD AND ITS NEIGHBOURHOOD.

By T. W. Gissing.

EXOGENÆ. Sub-Class I. Thalamifloræ.

Order—RANUNCULACEÆ.

Clematis. *Linn.*

C. vitalba, L. Clematis or Traveller's Joy. P. July—August. Garforth. Allerton Bywater, Mr. Roberts. Apparently rare.

Anemone. *Linn.* Anemone.

A. Pulsatilla. L. Pasque Flower. P. April—May. Smeaton. This rare and beautiful plant is fast disappearing from this the only locality in which it has been seen in flower for the last four or five years.

A. nemorosa, L. Wood Anemone. P. March—April. Generally distributed through the district. It is occasionally found with only three sepals.

RANUNCULUS. *Linn.* Crowfoot.

R. aquatilis, L. Water Crowfoot. P. March—August.

a. *circinatus.* Frequent in ditches and still waters.

b. *peltatus* (?) Havercroft.

c. *trichophyllus.* Campsall.

d. *hederaceus.* Common.

All these varieties of *R. aquatilis* seem to vary more or less every year, even in places where they have been growing many years. In the variety *hederaceus* I have noticed a peculiarity never seen by me in any of the others. The flower stalk springing from a lower point and adhering to the stem up to the next joint, where it diverges, thus making the flower-stalk double its apparent length.

R. Flammula, L. Lesser Spearwort. P. June—September. Common. Varying much in form.

R. Ficaria, L. Lesser Celandine or Pilewort. P. February—May. Common. This early favourite loves the sunshine and closes its flowers as the day dies—opening again on the morrow—after a few days the life ceases and the petals remain expanded and bleached.

R. auricomus, L. Wood Crowfoot—Goldilocks. P. April—June. Common. In this neighbourhood the flowers are rarely perfect—two or three petals in each generally being defective. A form is sometimes found with the stem leaves quite hairy on both sides and the root leaves hairy on the upper surface.

R. sceleratus, L. Celery-leaved Crowfoot. P. May—July. Frequent. By ponds and ditches; varying in height from three or four inches to two feet.

R. acris, L. Upright Meadow Crowfoot. P. April—December. Common. Sometimes with double flowers. Most of the species of *Ranunculus* are poisonous, but this plant is most dangerous, and serious accidents have happened to children from eating it. Like most of its genus the poisonous principle seems to be destroyed by drying—therefore it is freely eaten by horses and cattle when mixed with hay, although they pass it by when growing.

R. repens, L. Creeping Crowfoot. P. June—October. Common in cornfields and waste places.

R. bulbosus, L. Bulbous Crowfoot or Buttercup. P. April—August. Common. Although the trivial name Buttercup is given specially to this plant, it seems to be equally applied to all yellow-flowered species of *Ranunculus*. In Suffolk this plant and the *R. acris* are popularly called Paigles, and from enquiry it appears that that is the only county in which the plants are so called. There appears little doubt that these plants were the first to receive the name of Paigles; which has since, by some extraordinary process, been transferred to the Cowslip. (For much useful information upon the common names of British plants I would refer readers to Dr. Priors "Popular names of British Plants.")

R. arvensis, L. Corn Crowfoot. A. May—July. Common in corn fields. In Suffolk the popular name is "Gye."

CALTHA. *Linn.* Marsh Marigold.

C. palustris, L. Common Marsh Marigold. P. March—June. Common in wet places.

HELLEBORUS. *Linn.* Hellebore.

H. viridis, L. Green Hellebore. P. March—May. Askern and Conisborough.

H. fœtidus, L. Stinking Hellebore. P. February—May. Smeaton.

ORDER—BERBERIDACEÆ.

BERBERIS. *Linn.* Barberry.

B. vulgaris, L. Common Barberry. S. May—July. Criggling Stubbs and other places in that neighbourhood. (Mr. Forrest.) From the places where this plant is commonly found it is very doubtful whether it is a native of Yorkshire.

ORDER—NYMPHÆACEÆ.

NUPHAR. *Sm.* Yellow Water Lily.

N. lutea, Sm. Common Yellow Water Lily. P. June—August. Darfield.

ORDER—PAPAVERACEÆ.

PAPAVER. *Linn.* Poppy.

P. Argemone, L. Long Prickly-headed Poppy. A. May—August. Chevet. Cornfields.

P. Rhœas, L. Common Red Poppy. A. May and throughout the summer. Common.

The above two species (and probably others) are sometimes found with each petal divided almost to the base, and in some cases with the edge of the petal so divided as to appear fringed.

CHELIDONIUM. *Linn.* Celandine.

C. majus, L. Common or Greater Celandine. P. May—August. Pontefract, Stanley. Generally near dwellinghouses.

ORDER—FUMARIACEÆ.

FUMARIA. *Linn.* Fumitory.

F. capreolata, L. Rampant Fumitory. A. May—September. In cornfields, gardens, and waste places.

F. officinalis, L. Common Fumitory. A. April—September. Common in cornfields, &c.

Mr. Bentham in his valuable Flora treats all the other forms of *Fumaria* as varieties of this plant.

CORYDALIS. *D.C.* Corydalis.

C. claviculata, D.C. White Climbing Corydalis. P. June—August. New Miller Dam, Ossett.

C. lutea, D.C. Yellow Corydalis. P. May—August. Nostel, (Mrs. Watson.)

ORDER—CRUCIFERÆ.

CHEIRANTHUS. *Linn.* Wall Flower.

C. Cheiri, L. Common Wall Flower. S. April—August. Old walls at Pontefract.

BARBAREA. *Br.* Winter Cress.

B. vulgaris, Br. Bitter Winter Cress or Yellow Rocket. P. April—August. Common in wet places.

ARABIS. *Linn.* Rock Cress.

A. Thaliana, L. Common Thale Cress. A. March—October. On dry banks and waste places.

A. hirsuta, Br. Hairy Rock Cress. B. June—September. Frequent about Castleford and Pontefract.

CARDAMINE. *Linn.* Bitter Cress.

C. amara, L. Large Flowered Bitter Cress. P. April—June. Near Heath Bridge, over the Barnsley Canal.

C. pratensis, L. Common Bitter Cress. P. April—June. Common. Sometimes found with double flowers.

C. hirsuta, L. Hairy Bitter Cress. A. February—October. Common. The variety *sylvatica*, Link., is occasionally found.

NASTURTIUM. *Br.* Water Cress.

N. officinale, Br. Common Water Cress. P. April—October. Common.

N. sylvestre, Br. Creeping Yellow Cress. P. May—October. Banks of the Calder, Thornes, Sandal, &c.

N. terrestre, Br. Marsh Yellow Cress. A. May—October. Banks of the Calder, Thornes, Sandal, &c.

COCHLEARIA. *Linn.* Horse Radish, Scurvy Grass.

C. Armoracia, L. Horseradish. P. April—July. Frequent near towns and villages, and by the sides of streams, but always an outcast of cultivation.

DRABA. *Linn.* Whitlow Grass.

D. verna, L. Spring Whitlow Grass. A. February—July. Heath, Woolley.

HESPERIS. *Linn.* Dame's Violet.

H. matronalis, Common Dame's Violet. P. May—August. Woolley Edge. Probably taken there with manure.

SISYMBRIUM. *Linn.* Hedge Mustard.

S. officinale, L. Common Hedge Mustard. A. May—October. Common.

ALLIARIA. *Adans.* Garlic Mustard.

A. officinalis, D.C. Jack-by-the-Hedge, Sauce Alone. B. April—July. Common. Sometimes used in salads.

CONSIDERATIONS ON "*SPECIES*" APROPOS OF A NEW WORK BY M. JORDAN.

BY FRANÇOIS CREPIN,

Professor of Botany in the Horticultural School at Ghent.

(Continued from page 5.)

What we have called the new school is, in our opinion, destined to perish, and that by its very excesses. Already some, who had allowed themselves to be misled, have returned to more moderate views, and have begun to suspect the results of the cultivation of the creators of new species. However, this school in retiring from the scene, will not give up the battle. The Linnean school will divide itself, and we shall have again two schools; the progressive school, which will call experiment to its aid, and study Nature attentively; and that which will continue to make phytography an easy work. Already is the Linnean school drawing into its rear ranks a large number of *cabinet-botanists*, who, occupied principally in anatomical and physiological researches, consider the study of species as a secondary thing, as a distraction from studies apparently more important, and amuse themselves with arranging Nature after their own caprices. Having neither the time nor the courage to study deeply the species already created, impatient of the new types which

experiment and observation from time to time have succeeded in recognising and delineating, they say, we will reduce remorselessly, we will make fine and large specific types, which may be easily distinguished. To these *savans*, whether men of genius or not, may we not say—you have neither the leisure nor the requisite patience to occupy yourselves seriously with phytography, and therefore since you cannot follow attentively the species, either in nature or in experimental gardens, leave them in peace, and consecrate all your time to your pet studies; confine yourselves solely to the arrangement of classifications, to making, remaking and grouping genera. Let such then leave the work of the formation of *floras* to patient investigators, who make it their special study; let them no more decide questions which they do not understand, and of which they are often ignorant of the first principles. This language may seem bold, but it is fully justified by the strange deeds of certain persons, whose names, nevertheless, blazon the annals of science.

The progressive school,—the school of experiment—must again fight against the retrogrades; it must sustain the cause of truth against those cabinet-botanists, who, as M. Jordan justly says, establish nearly all their species from materials found in *herbaria*, and on very insufficient data.

Whilst awaiting the triumph of the Linnean progressive school, let us leave the innovators to march on in front; let us leave them, with their lively faith, patiently to investigate the character of that multitude of forms which they would make into species: they will execute the task better than we should, for nothing stimulates an observer so much, nothing renders his eye so piercing, nothing sharpens analysis more, than the thought of discovering new types where others do not see them. The regenerate Linnean school will follow them, will sift their creations, and verify their essays. At present, the important work for this school is experiments on cultivation, and profound observations on transitory forms. Also, it is beginning to perceive, that it is by these means that it will keep on the right side of its adversaries. As for ourselves we are quite confident of its success, and we hope that in the course of a few years it will have amassed such a number of positive proofs as will force its antagonists to silence.

We shall conclude these observations by stating a number of propositions, by way of a *résumé* of the question under discussion. They merit the study of all those who are interested in the eternal problem of species.

i.—The Linnean school has not generally made use of a practical criterium for being assured of the legitimacy of its specific creations.

ii.—The great majority of species of the Linnean school only rest on theoretic ideas,—hypotheses.

iii.—To constitute a species the Linnean school requires very decided characters ; but why these decided characters rather than less striking ones.

iv.—The Linnean species have, for the pledge of their value, but a limited number of well conducted experiments on cultivation ; thus it follows that the greater part of these species can only be *provisionally* admitted to the title of true species.

v.—The partisans of this school cannot therefore be logically dogmatic on the question of these species.

vi.—There is nothing to prove that a great many of these species are not assemblages of true species.

vii.—Already many of the species called Linnean, which were at first admitted as true units, have been acknowledged, even by the partisans of the Linnean school, to be composed of several units.

viii.—Certain partisans of the Linnean school, being under the false idea that the great part of the European *floras* are sufficiently well known, and that no European form remains to be discovered, have contented themselves with investigating known species, and have neglected the *attentive study* of that multitude of forms which they consider as simple varieties or variations.

ix.—Following out this erroneous opinion, they have refused to believe in the specific distinction of a certain number of forms which had been neglected, and which nevertheless possess characters quite as decided as the best types adopted by them.

x.—The repugnance which certain partisans of the Linnean school have shewn for the species created in these days, has its origin in their complete ignorance of facts.

xi.—Many of the reductions made by the Linnean school are the result of ignorance of facts, and ought to be considered as null and void.

xii.—Those reductions cannot have any real value which are not based upon experiments in cultivation, or on the existence of transitory forms establishing an *insensible gradation* between the pretended distinct species.

xiii.—The new school makes all its species to repose on a single practical criterium—the persistence of characters continued by seed.

xiv.—The criterium of the new school, good in itself, is practised incompletely, from which it follows that the species of this school can only be *provisionally* admitted as units.

xv.—Any form whatever remaining stable with certain characters, for five, ten, fifteen, or twenty successive generations, cannot therefore be

rigourously concluded to be *indefinitely stable* and cannot be admitted with certainty as a species.

xvi.—In order to admit to the title of a veritable species, any form remaining persistent after five, ten, fifteen, or twenty successive generations, it is requisite that it should be proved that every variety and every variation—unless the existence of such be denied—returns to its type after the first or second generation, or is seen to modify its characters.

xvii.—We cannot deny the possibility of the existence of varieties, persisting with their differences, for a longer or shorter time.

xviii.—A great number of the species of the new school do not even repose on the proofs of cultivation, and the only guarantee for their legitimacy is simply analogy.

xix.—The stability of certain species of the new school is contradicted by experiments made by the Linnean school.

xx.—In the actual state of science, we cannot, *from the present time*, consider the great majority of species, be they of the Linnean or of the new school, but as provisional specific types.

xxi.—We cannot admit the species created by the two schools as irreducible types, in our own age—our own geological period—until a very great number of experiments on their cultivation have been made, not solely by a few experimenters, but by a multitude of observers belonging to both schools : the results of which experiments should agree together.

xxii.—As of all the practical criteria which have been extolled so far there is but one really practicable—that founded upon essays in cultivation—we ought most carefully to attach ourselves to it.

xxiii.—In default of proofs furnished by cultivation, we may with advantage have recourse to the profound study of transitory forms.

xxiv.—When two forms are connected together by other intermediate forms (not hybrids) establishing a *gradual and insensible* passage from one to the other, we are to a certain extent right in assuming that they constitute but one species, the individuals of which oscillate between certain limits.

xxv.—Hybridism may also furnish proofs, to strengthen those derived from cultivation; but besides, that it presents great difficulties, some extraordinary facts have recently been brought to light, upsetting the ideas which have been admitted upon its results.

NOTES ON BUCKINGHAMSHIRE PLANTS.

By James Britten.

Spring has at last burst upon us in full beauty; the reign of winter, extended, as it has been, far beyond its usual limits, could no longer withstand the gentle influence of the vernal season, and suddenly gave way to more genial weather. The "green things upon the earth" have commenced their yearly task of praising and magnifying the Lord, and setting forth His goodness towards the children of men: and the flowers that have been fast bound beneath the soil spring again into life, "emblems of our own great Resurrection." The first blossoms of the year have always a peculiar interest for the botanist; he regards them with renewed interest as the fore-runners of the floral train, and examines them with a greater share of attention than he can afford to bestow upon the multitude which appear later in the season. Let me advise all those who wish to study botany, to begin as early in the season as possible: they will have but few plants to study; but this is better than waiting until later in the year, when the flowers crowd round us in such profusion that it is difficult to select any for special examination, so much that is new surrounding us on all sides. Any one who will carefully examine the daisy, the shepherd's purse, or the groundsel, will obtain more real information and botanical knowledge than a mere *collector* can gain in a whole summer.

As my rambles last year were received by the "Naturalist" with some degree of favour, I have ventured to jot down the following notes of my first really spring walk this year. My "hunting-ground" is the same as that of last season, the neighbourhood of High Wycombe; and I have no hesitation in saying that it would be difficult to find a place more richly endowed with Nature's treasures. It was but yesterday that I took a walk—a short, but most enjoyable one—to Dane Garden Wood. "Comin through the Rye" (not the cereal, but a meadow so called) the *Ranunculus Ficaria*, or "Little Celandine," as Wordsworth calls it, was opening its golden blossoms in profusion: these may have been intended by Shakespeare when he speaks of "cuckoo-buds of yellow hue." This plant has been constituted a genus by some under the name of *Ficaria:* the characters distinguishing it from *Ranunculus* appear to exist in the relative number of the petals and sepals, *Ficaria* having nine of the former, and three of the latter; while *Ranunculus* has usually five of each: but this distinction does not seem to hold good in

many cases. An interesting paper on this subject, by Professor Babington, appeared in *Loudon's Magazine of Natural History, vii.*, 375—377. In common with the other members of the genus *Ranunculus*, *R. Ficaria* has a true corolla, the calyx being composed of three, or more roundish sepals. The number of petals varies very considerably; and an instance has already been given in the "Naturalist," of a plant, the blossoms of which were perfectly double. Both flowers and leaves have a peculiarly glossy appearance, as though they had been washed over with gum; and the bright appearance of the former renders the poet's words particularly applicable to them, when he speaks of the blossoms which shine "like stars, to tell us spring is born."—Not far from this was the magnificent Marsh, or March Marigold (*Caltha palustris*) just opening its rich yellow flowers, which are composed of five or six sepals; this plant has no corolla, but the calyx makes up in brilliancy and beauty for this deficiency. A double-flowered variety is cultivated in gardens, and is reported to occur wild in the Grandchester meadows, near Cambridge. In one corner of the Rye, near the little river Wick, I observed the Butterbur, (*Petasites vulgaris*) in some plenty, bearing fine large heads of well-developed blossoms; this is a handsome species, and its leaves are, I believe, the largest among British plants; I looked for the fertile form. *P. hybrida* but could not perceive it.

Leaving the Rye, and going up to Keep Hill, I saw through the hedge, some fine plants of *Sedum Telephium*, with *Viola odorata* in the greatest abundance; here the purple-flowered variety predominated, though in some places in the neighbourhood the form with white blossoms (*V. alba*) is the more abundant. It must be clear to every one that this latter form has no claim to be considered even as a genuine variety. I gathered a very pretty specimen the other day, the petals of which were blotched with purple, and also saw others, exquisitely fragrant, but in colour pale lilac. I am informed that near Buckingham *V. odorata* occurs with deep claret-coloured blossoms; and that in some parts of Devonshire the form with purple flowers is but very rarely found, though *V. alba* is common. Mr. Watson appears to doubt the true nativity of the Violet, except in the Isle of Wight; but surely this is an example of carrying a principle too far. On Keep Hill, dwarf examples of *V. hirta* were observed: the absence of scent, and of creeping scions, as well as the difference of hue, well distinguish this from *V. odorata*, though some botanists have thought it not really a distinct species. On the sunny slope of the hill, the fierce and beautiful Tiger-Beetle (*Cicindela campestris*) was very abundant, apparently much enjoying the

bright sunshine; and the Brimstone Butterfly (*Gonepteryx Rhamni*) fluttered gracefully along. Here, too, the handsome spotted leaves of *Orchis mascula* were showing themselves plentifully.

Crossing the top of the hill, I entered Dane Garden Wood, the trees of which were just budding. Here was a complete undergrowth of *Mercurialis perennis*, with its insignificant flowers and dark green leaves, the latter of which in drying become a bright metallic blue. The delicate pink cones were just appearing on the larches; and the Yew (*Taxus baccata*) was in full blossom. Here and there the purple-veined flowers of the Wood-Sorrel (*Oxalis acetosella*) were opening, but as yet sparingly; while under the shade of the trees the Wood Anemone (*A. nemorosa*) unfolded its starry white blossoms, which are among the loveliest in Nature's garland. This, like the *Caltha*, has no true corolla; the sepals form the blossom, and are stated to be six in number: in a little bouquet now before me, fourteen specimens have six sepals, ten have seven, and four eight. A beautiful variety is cultivated in gardens, the stamens of which are converted into small lance-shaped petals. The under-side of the sepals is sometimes colourless, and at others shaded with pink, or pale blue. As the flower withers the colour deepens: in some cases, however, a pink, or even red tint affects the whole blossom. The Wood Rush (*Luzula sylvatica*) grew here in abundance; and the Peacock and Tortoiseshell Butterflies (*Vanessa Io* and *V. Urticæ*) occasionally enlivened my path. In this wood *Daphne Mezereum* had been long reported to grow; and as my many searches for it were on this day crowned with success, I may perhaps be allowed to make a few remarks upon the occurrence of this plant in Buckinghamshire.

Professor Martyn, at the end of the last century, stated that *D. Mezereum* grew "commonly in the woods" about Little Marlow; but as this statement was never confirmed, it was thought by some that the other species, *D. Laureola*, was intended. From enquiries which myself and others have made on the subject, it would, however, appear that, among the villagers, no plant was better known than this; known too by the right name, with the occasional variation of "Mezelion," or "Mazalum." In nearly all the woods for some distance round Wycombe, it was reported to have occurred; but unfortunately almost every one who had seen the plant growing wild, had transferred it to their gardens, and the gamekeepers in particular had made quite a small harvest of it, being able to dispose of the roots to gardeners and others for a trifling sum. Under these unfavourable auspices it was not surprising that my many searches for *D. Mezereum* had proved fruitless; for

though the plant was found last year both in Dane Garden Wood and in Fennel's Wood, near Loudwater, I myself did not observe it. When I made enquiries regarding the trees in cottage-gardens, the answer usually was that "the children had brought them out of the woods" : men working in the woods had frequently seen it, and had usually taken it when seen: and every one was most obliging in information about the plant, though no one was able to show it me—one woman, in particular, in her anxiety to please, stated that "she had seen it, O yes ! *she* had seen it : it had red berries, and grew about so high," the "so high" being at least seven feet ! The very general occurrence of *D. Mezereum* in this neighbourhood, over an area of at least twelve miles, and probably much more, seems to me to militate most strongly against the suspicion that it was originally introduced. It may be suggested that the trees in the woods are sown by the birds from the berries of garden specimens ; but I am told that the contrary is really the case : one person, who has several trees in her garden, assures me that none of them were planted, but she believes "that the birds brought over the seeds from the woods." This is a new way of putting the subject which deserves consideration. About a fortnight ago, I found several specimens in a shrubbery at Hughenden, where they had possibly been planted : but yesterday, while roaming over Dane Garden Wood, observing *Dentaria bulbifera* coming up in great profusion, and showing well for flower, I suddenly came upon two beautiful shrubs of *D. Mezereum*, in full flower, and about two feet in height. I felt myself well rewarded for my exertions : and certainly walked home in a state of great satisfaction. In the Park I saw very fine bushes of *D. Laureola* in full blossom, emitting a delicious scent ; here it was probably planted, though it occurs wild in nearly all the surrounding woods. *Vinca minor* was also abundant, though perhaps originally introduced : this, too, is native in the neighbourhood. By the side of the river Wick, at the back part of the Park, *Dentaria bulbifera* was very abundant, with *Ribes Grossularia*, not yet in blossom: and here my discoveries for this occasion terminated. Any future ones which I may make shall be duly recorded in the "Naturalist."

High Wycombe,
April 13, 1865.

Review.

A paper upon the Egg of Æpyornis maximus, the Colossal Bird of Madagascar, by Geo. Dawson Rowley, M.A., London. Trübner and Co.

The acquisition of a unique specimen, and especially a specimen of such importance as the egg of an unknown bird, rendered more interesting as a link between the geological and the present epoch, and which has formed a matter for much learned speculation, is undoubtedly worthy of being publicly made known, and in the paper before us Mr. Rowley has accurately described the specimen of the egg of *Æpyornis maximus*, of which he is the fortunate possessor, besides relating its history and giving his ideas and speculations on the bird which produced it. The size of this, the largest egg in the world is enormous compared with that of any known living bird, being 12¼ inches in its longest diameter whilst that of a fine ostrich's egg is only about six inches, and the capacity being in the proportion of about six to one; with the only other specimens extant which are now in Paris came the lower portion of one of the metatarsal bones found in the same locality with one of the eggs; this fragment M. Geoffroy St. Hilaire thought, indicated a bird shorter in the legs but thicker in the body proportionately than the ostrich and he placed the height of the specimen at from ten to fourteen feet. Whether this enormous bird still lives in the interior of Madagascar is scarcely matter of conjecture; our author thinks that if living within the last two hundred years it only lingered, but that it did remain till that time is shown by the fact that some of the cartilages were still adhering to the bones when found; time will no doubt by the discovery of further remains of the bird elucidate this question, and we trust that ere long a whole skeleton, as in the case of *Dinornis robustus*, Owen., will find its way to this country.

Reports of Societies.

Society of Amateur Botanists.—At a meeting of this Society, held on the 19th ult., at 192, Piccadilly, W., the president, M. C. Cooke, Esq., in the chair, the President read a paper from the "Natural History Review," *apropos* of M. Jordan's new work, which is now exciting so much attention; he also gave a short *resumé* of the botanical contents of the various Natural History magazines. Specimens of *Hutchinsia petræa*, from the churchyard wall at Eltham, Kent, were exhibited; and a few common spring flowers were laid on the table. The meeting was well attended.—B.

Wycombe Natural History Society.—A meeting for the formation of the above Society took place on Wednesday, the 26th inst., and was well attended. The interest which the study of Natural History had excited in one or two individuals, led them to believe that others might be led to share in their pleasures; and the result has proved that they were not mistaken. The aim of the Society will be to examine into the local productions, and to endeavour to gain some knowledge of the plants and animals which exist in such profusion in the neighbourhood. The Rev. T. H. Browne, F.G.S., was elected president, and Mr. Hy. Ullyett, Secretary, for the present year. The subscription is half-a-crown per annum. It was resolved that there shall be a meeting held once a month or oftener; in the summer for field rambles, and in the winter for comparing notes, &c. Seventeen gentlemen have already given in their names as subscribers.—B.

Warrington Field Naturalists' Society.—The seventh monthly meeting of this society was held on Wednesday evening, April 5th, 1865, Mr. B. Kendrick in the chair. The chairman exhibited a number of specimens of *Helix (rotundata ?)* which he had found in the stomach of a Starling; most of them were entire. The Secretary recorded an instance of the Boat-fly, *Noto-*

necta glauca, feeding upon the larva of *Dytiscus marginâlis*; he also read the following description of the Geometrical Leech *Piscicola piscium, (Hirudo geometrica*, L.*)* "Body elongate, terete, gradually attenuated anteriorly, with suctorial discs at each extremity, the posterior larger than the anterior; colour variable, usually greyish, closely sprinkled with irregularly shaped brown dots, the interruption of which at regular intervals marks the body out into segments; the disposition of these dots in the posterior disc is radiate, in the anterior somewhat cruciform; a row of whitish dots extends down each side. Length, about one inch; progression, geometrical, swims, like a leech, by undulations of its body; habitat, affixes itself to stones in clear streams. The habits of this animal in confinement are very interesting. If two freshly captured specimens be placed in the same vessel of water they frequently seize each other by twisting the foreparts of their bodies together, so as to resemble a knotted cord. Two leeches thus entwined will maintain their hold upon each other for half an hour or an hour, and when they separate each of them has a whitish fungus-like excresence protruding from its side. This embrace often results in the seeming death of one of them, for after the contact one of them is generally found lying at the bottom of the vessel, twisted into a painfully tight spiral. May not this be an act of reproduction? Another remarkable habit of this creature is the avidity with which it seizes fish that come into its way; a stickleback on being put into a jar of water containing three of these leeches was almost instantly seized by them in succession, and all the efforts of the fish to dislodge them were ineffectual, their hold upon anything to which they attach themselves being most tenacious. It is in the habit of fixing itself to stones in clear swift streams, probably there lying in wait for the chance of seizing the fish, such as trout, sticklebacks, lampreys, &c., which, in ascending the streams, take advantage of the eddies to rest, and thus bring themselves within the range of this parasite."—JOHN PEERS, Hon. Sec.

Observations.

Appearance of the Cuckoo.—This summer visitant was first heard here on the 9th of April.—JOHN RANSON, Linton-on Ouse, York.

Swallows.—Half a dozen Bank Martins *(Hirundo riparia)* were seen hawking on the Ouse, on April 9th, and my two chimney swallows *(Hirundo rustica)* were first seen on the 16th, and other two, which build in a neighbour's cowhouse were seen the same day. About six o'clock on the 19th, I was witness to the arrival of a flock of about fifty. They seemed very much fatigued, and rested for a considerable time on the ridge of a cottage, after which they dispersed to different parts of the village.—JOHN RANSON.

Arrival of Summer Migrants.—It is with great pleasure, after a long and severe indisposition, I am enabled to send you notice of the first appearance this year of the following summer migrants: Wryneck, April 13th; Swallow, April 16th; Nightingale, April 18th; Cuckoo, April 18th; Redstart, April 16th; Lesser Whitethroat, April 23rd; Greater Whitethroat, April 23rd; Chiffchaff, April 23rd; Willow Wren, April 23rd. I have kept a close watch upon the beach, but as yet I have not noticed the appearance of any of the spring birds of passage which always resort to this shore for a few weeks prior to their departure for their breeding grounds in the North; they appear very late this season as do also the smaller insessorial birds of passage.—SAMUEL P. SAVILLE, King's Lynn, Norfolk. Hunstanton Hall, April 23rd, 1865, per the Rev. F. O. Morris.

Scarcity of Swallows.—Ten days or a fortnight ago I noticed in the "Times" a note from one of their correspondents on the arrival, or non-arrival, up to that date,

of Swallows this year; and having since had my attention again directed to it, it has suggested to me to write to you to say that the almost total absence of these familiar birds from this parish this spring, so far, has been most singular and unprecedented. Up to yesterday, the 27th, I have not noticed in all, within four miles from here, more than a dozen swallows and martins, if so many, when and where, in other years, hundreds and hundreds might have been seen. What it is the sign or the sequence of, I cannot pretend to say; I have only observed one solitary martin up to the date named,—one other, if it was another, for it may have been a sparrow, was seen between four and five o'clock in the morning, about a fortnight ago, flying up to its last year's nest, in its "coign of vantage" over my window, as if to examine into the state of repair of its former domicile. I heard the Corncrake for the first time this year, at twenty minutes to four o'clock this morning, as I was taking a fourteen miles' walk home before breakfast. F. O. Morris, Nunburnholme Rectory, April 28th, 1865.

Summer rambles on the Orme's Head, Llandudno.

No. II.

Near Gogarth Abbey, which faces Conway Bay, I noticed fine plants of the Irish Shamrock, *(Medicago maculata)* covering the sheltered sunny bank below the ruin. On a closer inspection, I saw that the leaves had been eaten by the larvæ of a weevil beetle, *(Hypera variabilis)* that had revelled, for aught I know, on the drop of St. Patrick's blood! I observed the little network cocoons affixed to the withered leaves at the lower part of the stem. From these I bred the weevil in the course of a few days. A rare poppy, known as *Papaver hybridum*, was growing abundantly near the abbey; the small flowers and rounded bristly capsules are sufficiently characteristic of this species, which chiefly occurs in chalky cornfields. On the grassy borders of the same field grew the Bee Orchis *(Ophrys apifera)*. I gathered several flower-spikes; the bloom so closely resembles a humble-bee, as to give the idea of one actually resting upon it. The three Chats *(Saxicolinæ)* all have their nesting-places on the Orme's Head. Few birds are so noisy and restless; they seem as if they would attract observation by their very movements and chatter. The apple-green larva of the Burnet moth, *(Anthrocera Filipendulæ)* I met with not unfrequently in my rambles. It feeds on the Trefoil, *(Lotus corniculatus)* and when full-fed, it suspends its yellow cocoon to the culms of grasses. I found these cocoons in plenty on the stems of mat-grass in Conway Bay. The Forester *(Procris Statices)* is equally abundant on the Orme, its sluggish flight rendering it an easy prey to the collector. The Vervein, *(Verbena officinalis)* used by the Romans in their sacrificial rites, is plentiful along the footpath round the Orme. In more modern times, it seems to have been used medicinally, and this may account for its being often found in the neighbourhood of old ruined abbeys. The most common butterfly on the headland in the summer is perhaps the Greyling, *(Hipparchia Semele,)* which feeds, in the larva state, on various grasses. It has a rapid, wavy flight, and is impatient of approach, darting from stone to stone, and basking in the hottest sunshine. Two of the Pyralidæ *(Pyrausta* and *Ennychia)* are often its companions, sipping the sweets of the wild Thyme, on which they may have fed in the earlier stages of their existence. The Ennychia is a local insect. Another of the rarer Orchids *(Epipactis ovalis)* plunges its roots into the bare rock, braving the full scorch of the noonday sun, and growing in places where the Whitebeam *(Pyrus Aria)* alone seems to thrive. But decidedly the rarest plant of the Orme is the *Cotoncaster!* This shrub is not known to grow elsewhere in the British Isles. Here it grows on the ledges of the limestone rock, tenanting the same rough scroggy

ground as it does on the Continent. In autumn it is covered with its pendulous red fruits. It is near akin to the hawthorn, and others of the Pomaceæ. On the same ledge of rock I found the *Thalictrum flexuosum* and *Veronica hybrida*. The Henbane *(Hyoscyamus niger)* seems permanently abundant at Llandudno. It is one of the Solaneæ, and like the Nightshade, it has a forbidding aspect. The flowers are buff-coloured, pencilled with lurid purple, and blotched with the same colour in the throat. The smell to some people is not unlike that of the leaves of the black-currant, and it acts slightly as a narcotic.—PETER INCHBALD, Storthes Hall, April 16th, 1865.

Reason and Instinct.—Huxley "(Man's place in Nature,") seems if I understand him correctly, to suggest that articulate speech differs but in degree, from the mode of communication in use among our hairy cousins, and to agree with the writer of Ecclesiastes that there is no essential difference between "the spirit of man that goeth upward, and the spirit of a beast that goeth downward." The mystery of life is the same in both cases at any rate. The accumulating power of knowledge possessed by man is relied on by many, but when you go down to Bosjesmen or Andaman Islanders, where is this power? How much do they advance in a hundred generations? Or, do they advance at all in the sense meant? Not so much as some animals do. For example: European bees were brought out to South America; went in lively for honey and no mistake—first year, good store—second, ditto—third, the bees found out there was no winter—fourth year, declined altogether making any accumulation, eat the honey when they chose, and went out to gather more. Is that reason or are we to shirk the question by calling it instinct? In no intelligible sense does this differ from reason—inductive reasoning, in fact, as good as if they had studied the *Novum Organum*. Verily, there is some greater fact behind all existence than we wot of.—HENRY BIRCHALL, Bogotá, January 14, 1865.

Notes and Queries.

Early Mushrooms.—Yesterday during a walk with a friend, we gathered eighteen fine mushrooms, *(Agaricus campestris)*; is not this an extraordinary circumstance at this early season.—J. NORTH, Newsome, near Huddersfield, May 8, 1865.

Exchange.

I have in duplicate a good series of *Paludina Listeri* and *Unio Pictorum*. Any Conchologist being in want of a few of the above, can be supplied by paying carriage.—SYDNEY SMITH, Church, near Accrington.

Original Articles.

NOTES ON THE MUSTELIDÆ OF NORTHUMBERLAND.

No. II :—THE BADGER. *(Meles Taxus.)*

BY T. H. GIBB.

So rare has this quiet and innoxious animal become in Northumberland during the last twenty-five years that the appearance of one now is marked as a thing of note and is hailed with no small degree of pleasure by all true

lovers of animated nature. Of my own personal knowledge, and from what I can gather from the testimony of others better able, from their longer experience, to judge more correctly in the matter, they are gradually but surely becoming *scarce* and this too in a district which in the early recollection of our older inhabitants was comparatively thickly peopled by them. If this decrease of the badger be correspondingly great in other parts of Great Britain, I fear there may be reason to apprehend the severance of a link in our native *Mustelidæ*, and that *Meles Taxus*, will become as completely lost to us as the gigantic elk, which once roamed in all his majesty and conscious superiority, over the misty blue peaks of Helvellyn, the lofty and giddy heights of Ben-Nevis, or the cloud-capped summits of our own more modest Cheviots. This diminution in their numbers may be in a great measure attributable to the persistent and unmerited persecution to which from time immemorial they have been subjected. Up to the present time, if a badger is known to haunt a particular *locale* he is immediately sought after and encompassed by human foes, and sooner or later he is made to succumb to some one or other of their ingenious modes of capture, that he may be made the object wherewith to test the merits and hardiness of their dogs in what is popularly known as a "badger bait." The sooner the complete abnegation of this demoralizing practice takes place, the greater will be the chance of retaining *Meles Taxus*, a living representative amongst our indigenous mammalia.

The *tout ensemble* of the badger by reason of his short legs and heavy body is awkward and ungainly, and from the same cause his mode of locomotion is clumsy,and in many respects ludicrous, being something between a shuffling walk anda slow amble, which is at all times deviating and irregular, and stands out in strong contradistinction to the rest of the weasel tribe, which are all pre-eminently graceful in their soft, lythe and undulatory movements.

His food is varied and comprises both animal and vegetable substances. When the one fails him he falls back upon the other and between the two seldom wants a plenteous meal on which he thrives and generally attains, without luxuriating daily on turtle or *soup julienne*, to aldermanic corpulency before retiring to his bower in the hybernating months. Like the *Ursidæ* he displays a great liking for honey, which he appropriates with the utmost *sang froid*, caring little or nothing for the stings of the enraged bees, his thick mantle of fur proving a successful barrier to their combined attacks. Frogs and other members of the *batrachian* order ; beetles, grasshoppers,

and various other *articulata*, as well in their grub and pupal as in their perfect stages, together with the roots of succulent plants, are made subservient to his palate; young rabbits also become an especial dainty in contributing to his homely taste, to capture which he enters their burrows, and should they prove too small to admit of his greater bulk he will speedily enlarge their entrance, if they are placed in a sandy bank, as is most generally the case, and seldom fails when such a mode of introduction is begun, in securing his victims. Some believe him to be a destructive animal in our game preserves, and that he destroys the young and even the adult game birds. In a limited sense only is this true, for the subject of our remarks lacks agility in locomotion, to constitute him a successful game hunter, and his usual and more natural food, which I have here described, requires little exertion to procure, while to prey upon game demands the full exercise of faculties for which by nature, acquired habit, and instinct, he is in no way adapted. Like the otter he is crepuscular in his habits and feeds almost exclusively at night and during the spring, summer, and autumn months when *Hesperus* begins to shroud himself in his sable mantle, he leaves his burrow and stalks abroad for food, and as he winds his way along a broken path you may see him nosing the ground and with his snout turning up the surface for worms, roots, and the larvæ of insects, making frequent windings in his course, now stopping to catch a lost scent, or sitting erect on hinder legs as if listening for some anticipated danger, at which time he might be taken with his curious facial disc, for a sentinel or scout of the wild Sioux of the Colorado wilds. In 1863 a very fine specimen was captured near to Acklington in an ordinary rabbit trap which had been placed at the entrance to a rabbit burrow, and this brings me to mention the susceptibility of the foot to pain: for in this instance the jaws of the trap, possessing no great force or cohesive power only encircled the extreme end of the middle toe of the right fore foot, and although but a slight exertion was needed to free himself from the trap, yet it was sufficient to retain him an "unwilling captive," until he was secured the next morning by the trapper. The end of this individual, though spared the painful ordeal of being baited with dogs, was perhaps not less cruel than that which too often befals the most of his luckless race that have the misfortune to come under the protectorship and tender mercies of intellectual bipeds—for he was inhumanly shot in his prison house, that his skin might be forwarded to a taxidermist, perchance to be bungled in the stuffing by an unskilful artificer in the craft, into a distorted and shapeless mass of fur. The badger's power of scent is strongly developed—by the aid of which he is

enabled to follow, as truly as the finest nosed setter or spring pointer, the windings of a pursued animal with unerring accuracy and precision. This provision in his natural economy greatly assists him in discovering the hidden treasures of grub and pupa to be found underneath the surface of the earth, and while removing the soil for this purpose he is seen frequently to desist from his labours that he may the better and more certainly tell their whereabouts by the use of his olfactory organs. The wondrous muscular power of his fore limbs in conjunction with his long and powerful hard claws, constitutes him an adroit and skilful excavator, so that he can in an incredibly short time sink himself several feet deep into a sandy soil ; hence, the construction of a burrow in such a place for the reception of their young, is comparatively the work of a very short period. Their burrows are formed with no little ingenuity and skill, and always with an eye to the future comforts of the embryo family ; having numerous receptacles branching off at right angles to the main trunk, or passage, wherein are to be deposited the remains of rejected and offensive substances, which they usually cover over with earth as they are placed in them, thus keeping the family domicile in a cleanly and healthful condition. It has been said that the badger is a non-instinctive and stupid animal, but were there nothing else to refute such an opinion, than the foregoing illustration of his forethought and solicitude it is I think quite sufficient to place him in a rank *inferior* to none of his congeners ; and even to few other animals for sagacity and reasoning powers. During the winter months when piercing Borean blasts flit through the leafless trees of his forest home, he retires to his burrow to hybernate, but, unlike many other hybernating mammalia, he never lays up a store of reserved food to minister to the calls of nature, and in consequence of this, when the genial warmth of spring arouses him from his somnolent condition, or partial suspension of nature, to resume an active existence, he is seen to be the very antithesis in bulk of what he was in the preceeding autumn. In a few weeks, however, he recruits his strength, and becomes rotund, fat and robust, Late in the spring the female brings forth her young, of four or five in number, for which purpose she usually makes her nest apart from her regular burrow. The badger is easily tamed and speedily forms an attachment to its keeper—I have seen an adult, subjected only to a few days confinement, so remarkably quiet, that it could be handled with impunity ; and even evinced in this early stage of its domesticity, some traits of affection for the person who fed it. He will never rebel without great provocation, but when once aroused to exert his energies in self defence, he becomes a most inveterate

antagonist, and when attacked by dogs, he seldom yields without inflicting summary and terrible punishment on his foes. He possesses the unenviable property, but one common in a greater or less degree to all the weasel family, of emitting an unctuous ill-smelling secretion, but whether he can exercise any voluntary control over this effluvium, cannot be ascertained; although it is known to be always present to some extent when he is disturbed. In the rural districts, where he is known, and a primitive style of diction and simple mode of speech prevail, the distinctive epithet it "*stinks like a brock*," is often applied to putrescent substances, and objects of offensive odour, as characteristic of *Meles Taxus*. This singular property is pre-eminently developed in a transatlantic congenerous species, the Skunk, *Mephitis varians* of North America,—so powerful and penetrating is the noisome and fetid odour which the skunk exhales, that I have felt its offensive intrusion at a distance of 100 paces from where I lay in bed, in a room in which both doors and windows were tightly closed.

The badger is sociable in his habits, and when several individuals are located in one particular district, they are wont to fraternize together and form colonies in which they live in perfect amity one with the other—seemingly conscious of their naturally defective powers for rapid locomotion, and the better to secure their common and individual safety, they pitch their colonies in the most retired and secluded retreats. In the deepest recesses of some primeval and densely undergrown wood, or at the base of some rocky gorge, which from their inaccessibility to unwelcome intruders offer a safe asylum, the abodes of the badger may be found, but the greater number of these villages, or well selected retreats are now untenanted; thus, affording another proof of the slow but perhaps not the less sure extinction of their once busy occupants. On the Rosscastle and Hepburn hills—on the wooded slopes of Biddleston, and in other such places throughout Northumberland, a few individuals may still at times be seen, at others very rarely. The last ever seen in this neighbourhood, were a pair of young ones trapped a year or two ago, in the Duke's Park, in our immediate vicinity. They are preserved at Huln Abbey, a notable monastic ruin occupied in the middle ages, by Carmelite Friars. The colour of the badger's hair, which is thick, long, and compact, and tapers to a very fine pliable point, is a mixture of grey brown and white. The body is brownish grey, blending with a silvery grey on the sides; the whole of the under parts, throat, breast, abdomen, legs, and feet, are of a deep brown, approaching to black. The upper parts of the face and forehead, up to the anterior part of the neck, is cream coloured white; on each

side of the face commencing at the nose, runs a definitely marked line of dark brown, which includes the eye and ear in its course, and terminates at the neck—the upper and under jaw and cheeks are also cream white. The singular distribution of the markings of the head and face gives it a unique, quaint, and venerable expression, and conduces not a little to render him a favourite with all those who view him apart from the unfavourable associations too often connected with him. The usual length of the badger is about 2 feet 8 inches, but I have met with them longer than this. The weight of a full-grown animal in good condition will exceed 30lbs.

Alnwick, April, 1865.

NOTES ON THE ORNITHOLOGY OF NORFOLK.

By T. E. Gunn.

VARIETIES.

Buzzard. About the 20th of January last, a variety of *Falco buteo* was purchased in our market; the whole of its plumage was of a uniform dark chocolate, inclining to a lighter hue on its under part.

Blackbird. A nice female variety was killed at Hockering on the 6th ult. The crown of its head, cheeks, and all the surface of its back and wing coverts were of a dull ash grey, the feathers of the latter slightly margined with a faint reddish tint; upper surface of its wings and tail white, throat and chest of a pale reddish tinge, a narow dark ash-coloured stripe running down the centre of each feather; abdomen, flanks and vent, white, faintly tinged with pale ash; under surface of its wing and tail feathers of a pale ash grey; under wing-coverts white; iris light brown; beak and legs, corresponding with the colour of its plumage being much lighter in hue than usual. Its stomach contained worms, earwigs, and likewise a few small fibrous roots.

Robin. January 31st, I saw a curious variety of *Sylvia rubecula* in the hands of one of our birdstuffers. It was obtained a day or two previous at Rollesby. The surface of its head, neck, back, and upper wing coverts was of a dull yellow; its red throat and breast much paler than in ordinary specimens; upper surface of wings and tail of a pale yellow, gradually inclining to white at the tips of the quill feathers; the shafts of the same also

white, under surface of its wings and tail feathers of a pale yellowish brown, belly, white ; flanks, thighs and vent of a pale yellowish tint ; iris, light hazel ; bill and legs, pale yellow ; it was a hen bird, and in very good condition.

Chaffinch. A person named Howard killed in this neighbourhood on the 17th instant, a splendid old male variety of this species. Its head and neck were of a pure white, with the exception of a few bluish slate-coloured feathers scattered over the surface of the former ; back and scapularies brown intermixed with patches of pale yellow, and white ; rump green with a few white feathers ; part of quill feathers in wing, white ; under surface of wing, white ; breast and abdomen, pale brown intermixed with white.

Skylark. A buff-coloured variety of the Skylark was taken about the 25th instant ; upper parts of a uniform buff, feathers marked with a shade of darker tint, under parts of a cream colour.

Rook. An immature male killed on the 24th ultimo ; it had a patch of white feathers under its throat, the first four or five primary quill features in each wing were also white.

RARITIES.

Merlin. A few immature birds of this species of the Falconidæ, usually occur each season in Norfolk, the mature birds being of more rare occurrence. I have seen but one instance of the latter during the last four years, that being a splendid male specimen obtained somewhere in Norfolk in 1860, or the following year. A nice male example of the former was taken in this locality during the latter part of last month. From beak to tail (both included) it measured eleven inches.

Great Grey Shrike. An old male about the 13th instant.

Hawfinch. The only individual of this species I have seen this winter is a fine old male now in the possession of Mr. Pear, birdstuffer. It was obtained at Saxlingham during the latter part of January.

Crossbill. A fine old male was shot on the 26th of January on some firs on Mousehold near this city. During the whole of last year I never saw a single individual of this species, and the above is the only instance I have seen this year.

Hooded Crow. On the 3rd instant, a male was killed at Brundall.

Quail. A female was shot at Bessthorpe early in January.

Grey Plover. Two males were taken about the 16th instant, one measured twelve and a half inches from the tip of beak to tail, the latter included ; wing from carpal joint, eight inches ; bill from gap to

tip two and three-quarter inches. The other was twelve inches from beak to tail; wing from carpal joint seven and three-quarter inches; beak two and a quarter; I thought, until after the birds were skinned and dissected, that they were male and female, more particularly as the smaller bird carried much darker markings than the other, upon examination however, it proved to be the contrary. Their gizzards contained vegetable matter and a little grit.

Sanderling. A female on the 25th ultimo.

Bittern. *Ardea stellaris* occurred pretty plentifully last season in Norfolk; and it has again visited us this season in rather large numbers. The following instances have came under my notice during the past two months; a fine male on the 17th ultimo, killed by Mr. J. T. Frere in Roydon Fen, near Diss. I received information that another was obtained about the same time at Langley, but not seeing it, I could not ascertain the sex. On the 28th of January, Mr. J. Pear, birdstuffer, received a male for preservation from Surlingham, it having been killed the preceeding day on the road. Two examples were purchased in our market during the earlier part of this month, and a nice immature male was killed this morning in the vicinity of Statham.

Knot. A female on the the 28th of January.

Grey Phalarope. An example was obtained at Hasbro' in the early part of January. It fell into the hands of Mr. T. Knights, birdstuffer, in whose possession I saw it.

Bewick's Swan. I have seen two nice examples of this rather rare species, both of which were offered for sale in our market, one on the 1st instant, and the other a day or two after. Both appeared to be males.

Gadwall. An immature bird of *Anas strepera* was killed with other wild fowl by a person named Deane, on the river Yare near Coldham Hall, on the 9th instant, he disposed of it with the rest of his game to a dealer.

Velvet Scoter. A second example (also an adult male) of this rare species has occurred on our coast this season. It was purchased by a birdstuffer on the 28th ultimo. It is rather a larger specimen than the one previously mentioned in a former number of the *Naturalist*, and like that individual appeared to have suffered much from the severity of the weather. Its gizzard seemed very muscular (the sides being an inch thick), it contained a few marine shells, pebbles, and a few small pieces of crab's claw.

Scoter. Several individuals have occurred, amongst them I noticed three or four fine adult males.

Golden Eye. A few old males.

Smew. I saw two nice females of *Mergus albellus*, hanging in our

market on the 16th inst.; the same day Mr. F. Frere, of Great Yarmouth, who was out shooting on Breydon Water, succeeded in obtaining a couple of birds of this species, both males. One, a fine mature specimen, and the other a younger bird, just shewing a few of the side and wing markings of the adult plumage; the remainder of its plumage retained the hue of the female, only of a somewhat brighter tint.

Red-breasted Merganser. About the 14th instant two splendid adult males were killed at Salthouse. The adult male is rather rare in this county, these being the only instances of its occurrence that I have observed during the last four years. The female and immature specimens, not unusually occur each winter season; from tip of bill to the tip of the tail the male measures two feet: wing from carpal joint to tip, ten inches; bill, three inches; longest crest feathers three and a quarter inches, iris, bright red. The gizzards of the above examples contained a few pebbles.

Goosander. January 27th, a magnificent old male was shot by Mr. J. N. Spanton at South Walsham, who sent it to Norwich for preservation; during the course of the same day, the birdstuffer received a female from the same neighbourhood, I saw the two birds laying on the shop-board together a short time afterwards; I was much struck with the strange contrast they presented to each other as regards the hue of their plumage, as well as size; the bright colours of the male when compared with the dull plumage of its companion, might cause a person not particularly acquainted with ornithology to pronounce them two different species. Their measurements are as follows:—

	Male.	Female.
Tip of bill to tip of tail.....	27 inches.	24 inches.
Wing from carpal joint	11½ „	10 „

I have also noticed the following occurrences of the female. Four or five examples at various times during this and the preceeding month in our market; one obtained somewhere in this county on the 3rd instant, the breast of which inclined to a pinkish hue, instead of the usual rich cream tint; another example was taken on the beach at Holkham, near Wells, on the 10th inst.

Red-necked Grebe. The red-necked Grebe *(Podiceps rubricollis)* has made its appearance in rather plentiful numbers on our coast and in the neighbourhood of our broads during the course of this month, being driven to land by the strong north-easterly winds prevailing during that period, I have seen upwards of sixteen specimens in the possession of one of our birdstuffers, who received most of them for preservation for various parties. My friend

Mr. Knights also informs me that he has had about fifteen specimens brought in principally from the neighbourhoods of Salthouse and Great Yarmouth. Amongst the examples I noticed was a fine adult female that was killed by Mr. Beevor, at Hargham, on the 17th, and two nice males from Briston, on the following day, killed by Mr. J. W. Hill, of that place. Much similarity appeared to exist in both sexes in the colour of their plumage, each individual shewing slight indications of the reddish tinge of its neck, chiefly at the sides ; in that of the adult female I before noticed, the reddish tinge was particularly conspicuous in that part; the breast and under parts of this example were also much stained with the vegetable matter upon which it had subsisted since its arrival on our shores. The beak of the female is yellow, assuming a paler tint towards the tip, and that of a pale brown on the top of the upper mandible ; the males shew the yellowish hue only at the base of both upper and lower mandibles, the remaining portion of the beak being of a uniform dark brown approaching to black; iris, pearly white. The upper surface of the feet and toes of the male are tinged with a pale reddish hue, while those of the female incline to yellow ; I particularly noticed this tinge in fresh killed birds, as the colour soon fades out of the feet of stuffed specimens. The following are the measurements of three examples I examined in one day :—

	Adult Male.	Adult Female.	Immature.
Beak to tail both included...	18 inches.	15 inches.	18 inches.
Wing from carpal joint	$7\frac{3}{8}$ „	$6\frac{1}{2}$ „	$6\frac{3}{4}$ „
Beak from gap	$2\frac{3}{8}$ „	$1\frac{3}{4}$ „	$2\frac{1}{8}$ „

In nearly all the specimens I dissected the stomachs contained vegetable food, chiefly grass and weeds, which matter was likewise intermixed with feathers, which were very probably swallowed by the birds when skimming the surface of the water. I examined one on the 16th inst., and it appeared that Roach, *Leuciscus rutilus*, had wholly constituted its food during the last meal or two, as I took several from its stomach, one of which I found entire ; it measured six inches in length (which I think is rather an unusual sized morsel for this species to swallow at one mouthful). In another individual, I noticed the contents of the stomach to be composed entirely of feathers, quite verdant, being stained with the juice of the vegetable matter that it previously contained.

Sclavonian Grebe. I saw a nice male on the 25th inst. Its stomach contained grass, weeds, and a few small fishes.

Black-throated Diver. A nice immature male of this species was taken on the sea-beach at Holkham, near Wells, about the 10th of February.

In dissecting its stomach I found some sea-weed, and a few pebbles about the size of peas. The immature birds of *Colymbus arcticus* and *C. septentrionalis*, bear such a resemblance to each other, both as regards the colour of their plumage as well as size (for both species vary considerably in the latter), that mistakes are doubtless frequently made when examples are obtained; by comparing them however, the distinction may easily be detected. The upper mandible of the bill of the former will be found to curve downwards at the tip, while that of the latter takes an upward curve.

Norwich, Feb. 28th, 1865.

ON SOME SPECIES OF *THLASPI*.

By John Windsor, F.L.S. &c.

In the second series of the "Phytologist," were published lists of Settle plants (which I purpose in a while to have reprinted in a separate and I hope improved form.) In the number for June 1856, I ventured in speaking of *Thlaspi alpestre* to express my doubts as to the separating it, as had been done by some, into different forms, varieties or species.

Recently (1865) I have examined and compared dried specimens of the plant from the neighbourhood of Settle, which has been named *Thlaspi Occitanum (Jord.)* or more lately *T. occitanicum* by Jordan, from being found in Occitania (Languedoc) in France, with specimens from Matlock, or that form which has been called *Thlaspi virens*.

I do not find any characteristic differences in the two as to the form of the pouch, its lobes and intervening notch, or the length of the style, all of which are somewhat variable occasionally, even in the same plant.

I would offer the same remarks as to *Thlaspi alpestre*, from Teesdale or Northumberland, in which I do not detect any essential distinctions from the Settle and Matlock plants and this applies also I think to *Thlaspi alpestre* sent by M. Crepin from coppices (*bois taillis*) at Vignèe, Namur.

The *Thlaspi montanum* also sent by M. Crepin from stony places ("*rocailles*") at Han sur Lesse, Namur, is probably, although much like *alpestre*, a different plant, as the flowers appear decidedly larger, but there are no pouches present in my specimens, the inflorescence presents a somewhat corymbose appearance, which occurs also in *alpestre* in an early stage of growth, but is afterwards gradually elongated into a raceme of vari-

able length, and hence the plant according to its age, varies considerably in stature and general aspect. The styles also by age are apt to fall off, except perhaps in one or two more recent shoots from the same stock. The appearance of the plant may be also somewhat influenced by its place of growth.

I may here remark that it seems, at least not unfrequently, to affect a locality in which lead or calamine is existing, as near Settle, and also at Matlock. In such situations it is often associated with *Arenaria verna.*

The *Thlaspi perfoliatum* from Oxfordshire, although presenting much the aspect of *Thlaspi alpestre,* is I believe a distinct species, but at present I should feel a difficulty in making the same admission for *virens* or *occitanicum.*

In *Thlaspi alpestre,* (including the Settle, Matlock, and Teesdale plants) the lobes of the silicle at first quite approximate the style, but as the pouch developes itself, they somewhat diverge, and thus generally a distinct notch is produced. This is often visible in the same plant, on comparing the lower more matured pouches with the upper less advanced ones.

With regard to the Teesdale plant, I have hitherto only had an opportunity of seeing it in its mature state, when it presents a rather taller stature than is often seen in the Settle or Matlock plants, but this I believe is due simply to a different period of growth, modified perhaps occasionally by differences of soil and situation.

All at first are rather short in stature, and the inflorescence then has a corymbose or subcorymbose appearance, which afterwards, as the growth proceeds, gradually assumes a racemose or spike-like extension, and thus the height of the plant becomes considerably increased.

MATERIALS FOR A FLORA OF WAKEFIELD AND ITS NEIGHBOURHOOD.

By T. W. Gissing.

(Continued from page 10.*)*

Capsella. *D. C.* Shepherd's Purse.

C. Bursa-pastoris, D.C. Common Shepherd's Purse. A. Nearly all the year. Common.

Lepidium. *Linn.* Pepper Wort.

L. campestre, Br. Common Pepper Wort. A. May—August. Frequent.

BRASSICA. *Linn.* Cabbage, Rape.

B. Napus, L. Rape or Coleseed. B. April—July. Occasionally in waste places : very doubtfully wild anywhere.

SINAPIS. *Linn.* Mustard.

S. arvensis, L. Wild Mustard or Charlock. A. April—August. Common.

DIPLOTAXIS. *D.C.* Rocket.

D. tenuifolia, D.C. Wall Rocket. P. June—October. Old walls at Pontefract.

RAPHANUS. *Linn.* Radish.

R. Rhaphanistrum, L. Wild Radish. A. June—October. Frequent in cornfields.

ORDER—RESEDACEÆ.

RESEDA. *Linn.* Dyer's Rocket. Mignionette.

R. Luteola, L. Common Dyer's Rocket or Yellow Weed. A. June—October. Common.

R. lutea, L. Wild Mignionette. A. June—October. On the limestone. Common about Pontefract, Knottingley, &c.

ORDER—CISTACEÆ.

HELIANTHEMUM. *Tourn.* Rock Rose.

H. vulgare, Gært. Common Rock Rose. P. July—September. Kippax, Garforth.

ORDER—VIOLACEÆ.

VIOLA. *Linn.* Violet.

V. hirta, L. Hairy Violet. P. April—July. On the limestone. Abundant about Wentbridge.

V. odorata, L. Sweet Violet. P. March—May. Frequent. The *white* variety is found at Chevet. A *pink* form is sometimes found.

V. palustris, L. Marsh Violet. P. April—July. Lofthouse, Ackworth, Soothill Wood.

V. canina, L. Dog Violet. P. March—July. Common. The *hairiness* of this plant curiously varies. In the early state the leaves are quite *glabrous*, but after flowering the *older leaves* are *hairy* on the upper surface, and again when they are dying off the hair disappears. Sometimes there are hairs on *one* only of the lateral petals.

V. tricolor, L. Pansy or Heart's Ease. A. June—October. Common in cornfields. The variety *arvensis* is often found.

ORDER—POLYGALACEÆ.

POLYGALA. *Linn.* Milkwort.

P. vulgaris, L. Common Milkwort. P. May—September. Frequent, with pink, white, and blue flowers.

Order—CARYOPHYLLACEÆ.

Saponaria. *Linn.* Soapwort.

S. officinalis, L. Common Soapwort. P. July—October. An outcast of gardens.

Silene. *Linn.* Catchfly.

S. inflata, Sm. P. June—September. Common. The leaves taste like green peas.

Lychnis. *Linn.* Campion.

L. Flos-cuculi, L. P. May—August. Frequent. Flowers varying in colour from white to deep rose colour.

L. vespertina, Sibth. B. or P. June—October. Common. Flowers varying much in colour.

L. diurna, Sibth. P. June—October. Common. Flowers varying much in colour.

Agrostemma. *Linn.* Corn-Cockle.

A. Githago, L. P. June—October. Frequent.

Sagina. *Linn.* Pearlwort.

S. procumbens, L. P. April—October. Common. Varying much in size and form.

S. nodosa, L. P. July—October. Near Pontefract.

Arenaria. *Linn.* Sandwort.

A. serpyllifolia, L. A. June—October. Common.

A. trinervis, L. A. April—August. Common. Calyx almost invariably longer than the petals.

Stellaria. *Linn.* Stitchwort or Chickweed.

S. nemorum. L. P. May—July. Heath.

S. media, With. A. All the year in flower. Common.

S. Holostea, L. P. March—August. Common.

S. graminea, L. P. May—August. Frequent.

S. uliginosa, Murr. A. April—July. Common.

Cerastium. *Linn.* Mouse-ear Chickweed.

C. aquaticum, L. P. June—October. In several places by the Calder.

C. vulgatum, L. A. March—October. Common. Varying much in size.

C. viscosum, L. P. or A. All spring and summer. Frequent.

C. semi-decandrum, L. A. March—June. Heath.

C. arvense, L. P. April—September. Heath, Garforth.

ON PETASITES OFFICINALIS.

By H. G. Baker.

I beg to forward you a description of *Petasites officinalis* as it occurs in this neighbourhood, and should be glad if your readers would direct their attention to this plant as the form met with in this country seems to differ from those found on the continent. Boreau describes two species in his *Flore du Centre de la France* : I subjoin translations of his account of them, and also a similar description of our own plant.

P. riparia. Jordan ! Root-stock thick, fleshy, and spreading, producing tufts of pubescent stems from eight inches to two feet in height furnished with loose elongated reddish scales ; flower-heads, numerous, from one to three on each peduncle, united in an oval oblong thyrsoid cluster which is narrowed at the summit ; bracts lanceolate acuminate ; involucre oval, oblong, not spreading out at the summit, with brown adpressed oblong obtuse phyllaries which are shorter than the flowers and the pappus ; stigmas short and oval ; leaves coming after the flowers and growing very large as the season advances. They are furnished with long stalks, and in shape are cordiform oval, unequally denticulate and slightly angular, green in colour, and a little cottony on the upper side, whitish-tomentose beneath, with the basal lobes not contiguous, the bottom of the space between them bordered by a nerve, flowers reddish and scentless.

P. pratensis. Jordan ! Root-stock thick and wide-spreading, producing solitary pubescent stems, from eight inches to two feet in height, which are furnished with numerous oblong or lanceolate reddish violet scales ; flower-heads numerous, usually one or two, occasionally three on each peduncle, united in an oval oblong thyrsoid cluster which is not narrowed to a point at the summit and finally becomes exactly cylindrical ; bracts linear, lanceolate, acuminate, violet in colour ; involucre oval, equal, with scales of a beautiful violet colour, not adpressed, rather loose, oblong, a little acute, surpassing the flowers and the pappus at the flowering time ; stigmas short, linear, and erect, pappus equalling the flowers ; leaves coming after the flowers, bright green, and cottony on the upper side, whitish subtomentose beneath, somewhat undulated roundish cordiform, unequally denticulate, slightly angular, the basal lobes rounded. The flowers are purplish and slightly scented.

P. officinalis. Angl. Root-stock thick and wide-spreading, producing two or three pubescent stems from six to eighteen inches in height, which are furnished with numerous scales of a pinkish mauve colour, naked below, and silky on the outside, the upper part keeled, and the point leafy; they are from two to three inches long, lanceolate in shape, the lowest quite an inch broad, recurved, those of the lower flowers nearly or quite twice their length when not expanded, the upper bracts linear, lanceolate, and shorter than the flowers; flower-heads always solitary upon one peduncle united in an oval oblong thyrsoid cluster not narrowed at the summit; peduncle silky; involucre obconical, silky at the base, one or two narrow acute phyllaries shorter than the rest which are equal, slightly shorter than the expanded florets, very various in breadth, naked, green on the back, all round the edge a delicate pinkish mauve colour like the flowers, bracts and scales, narrowed suddenly to a bluntly triangular or rounded point, stigmas sometimes protruded beyond the flower, and the style visible, sometimes quite included by the anthers; leaves attaining considerable size before the flowers disappear; in form rather broader than deep, usually somewhat angular for the lower half, the lobes so much cordate that they often overlap, in colour bright green on the upper side, slightly cottony beneath. The flowers have a faint sweet scent, and quite lose their colour in drying and become dirty sepia-brown.

Judging from the descriptions our plant seems nearest to *P. riparia*, but to differ as follows :—

1st. In the flower heads, which in *P. riparia* are said to vary from one to three in number upon a peduncle, and in our plant are always single.

2nd. In the flower cluster, which is narrowed almost to a point in the continental species, and in ours is quite blunt at the summit.

3rd. *P. riparia* is said to have brown phyllaries, whilst in our plant they are green with a delicate pinkish border.

4th. In *P. riparia* the leaves come after the flowers, in the English plant they are frequently half a foot wide before the flower disappears.

5th. The leaves in *P. riparia* are cottony on the upper side, and their basal lobes never overlap; ours are not at all cottony, and the lobes frequently overlap.

6th. The continental plant has no scent whilst *P. officinalis* is odorous.

Sowerby, near Thirsk, May 11th, 1865.

Reports of Societies.

WARRINGTON FIELD NATURALISTS' SOCIETY.—THIRD ANNUAL MEETING.—The third annual meeting of this society was held in the news-room of the Mechanics' Institution on Wednesday evening last, under the presidency of T. G. Rylands, Esq., F.L.S., &c. The objects exhibited consisted of ferns,—chiefly British—supplied by Mr. Green, gardener to Colonel Wilson Patten, M.P. ; dried plants from the society's herbarium, and the more interesting ones found in flower at the present season ; a collection of wood-boring insects, and several cases of birds's eggs, kindly lent, the former by Mr. Noah Greening, and the latter by Mr. E. Milner. Amongst the most attractive objects was an aquarium containing fishes and aquatic insects ; one of these was the water spider, with its curious nest, which has lately been added to the list of curiosities found in the neighbourhood by Mr. Peers, the society's honorary secretary. A collection of fresh water shells was also presented by Mr. Peers. Microscopes, showing numerous objects, attracted considerable attention ; they were lent by Mr. Beck, Mr. Redmayne, Mr. Hepworth, and Mr. Cash. After some time had been spent in examining the varied and beautiful objects exhibited on every hand, the proceedings of the meeting commenced. After a short address by the President, the secretary, Mr. Peers, read the report, which, after noticing the number of meetings held during the past year, said there had been no falling off in the number of members, the blanks left by death or removal having been filled by new ones. There were forty now on the list, besides five honorary members, against a total of thirty-five in last report. He read a paper, the object of which was to invite members and friends of the society to join in the compilation of a list of natural objects of the Warrington district, and pointed out how such a work would tend to the extension and better prosecution of the study of natural history in Warrington. Mr. Paterson read an exceedingly interesting paper on the geology of the district. A paper on the Desmidiaceæ, with special reference to local species, and illustrated by figures, was next read by Mr. Cash.

HIGH WYCOMBE NATURAL HISTORY SOCIETY.—The members met on Saturday afternoon April 26, for their first field day. It was arranged that they should go over Keep Hill and Dane Garden Wood so as to gain some idea of the natural productions of these places. Mr. Thurlow had brought to show them two young specimens of the trout that had not long been hatched. As these little creatures are at first "too feeble to employ the mouth in obtaining subsistence, they bear a portion of the egg still adhering to the abdomen like a transparent amber-coloured sac, flecked with tiny blood vessels," this is gradually absorbed as the fish becomes able to provide for itself. The pulsations of the heart could be seen through this sac, with the naked eye. A short time was spent in picking up some of the fossils that lay scattered about the floor of a quarry, and in listening to explanations by the President on the formation of chalk and flints ; after which the members started across the hill. Fortunately the day was very fine, but scarcely warm enough for many kinds of insects, especially as it was late in the afternoon, but several were found,—*Cicindela campestris*, *Timarcha lævigata*, *T. coriaria* : one or two female specimens of the *Meloe majalis*, were also seen just about to deposit their eggs. The larva of *Bombyx Quercus* was taken off the hawthorn, and an empty cocoon of the same from underneath a projecting tuft of grass. Vast numbers of the *Tineina* were flying about, and a few of the *Thecla rubi* and *Thanaos Tages*. Among the birds some beautiful specimens of the Stonechat *Sylvia rubicola* were noticed. The Early Purple Orchis, *Orchis mascula*, was in flower on the hill. *Veronica montana*, was found in flower by Mr. Britten, who had

also previously pointed out localities for *Dentaria bulbifera*. Although this beautiful plant is one of our very rare English ones, it grows here in great profusion: *Ranunculus arvensis* was also in flower in a neighbouring field. Three hours passed swiftly and pleasantly away in looking for these natural objects and in commenting upon them when found, and the members returned home over the hill again about six in the evening.

Richmond and North Riding Naturalists' Field Club.—Monthly meeting, May 9th. The President, E. Wood, Esq., F. G. S. in the chair. The following new members were elected viz :—Messrs. P. Metcalf, Easby ; J. Capper, Newcastle ; C. Pallisor, Northallerton ; F. Smith, Richmond. Mr. Wood exhibited a perfect specimen of the fossil *Woodocrinus macrodactylus* discovered by him in Swaledale, and now so well known amongst geologists ; also, amongst other fossils, an elephant's tooth which had been turned up during the recent draining excavations in the metropolis. Mr. J. Aspdin exhibited a male specimen of the Goosander *Mergus merganser*, shot near Richmond, in January, 1864 ; also a specimen of the Sclavonian Grebe, *Podiceps cornutus* ; and a female widgeon, *Anas Penelope*, assuming the plumage of the mature male, both recently shot at the mouth of the Tees. Mr. Milligan exhibited a case of Little Grebes, *Podiceps minor*, as also a case of Partridges, *Perdix cinerea*, the latter having been found frozen to death near Richmond, during the severe winter of 1861. A large and valuable collection of Botanical specimens were presented to the club by the Rev. Scott F. Surtees, and a resolution conveying the thanks of the club to the donor, unanimously adopted. At the close of the meeting Mr. Wood expressed a hope of seeing a larger attendance of the members, at his house on the Monday following, to inspect his museum and receive an explanatory lecture on its contents. After a vote of thanks to the chairman, the meeting adjourned to the second Tuesday in June.

Observations.

Anecdote of a Cat.—The following was sent to me by Miss Fullerton, sister to Mr. Fullerton of Thryberg Park, near Rotherham, it is perfectly true, and therefore may be placed on record, but I only wish to be considered as furnishing it as a singular coincidence of facts, and not as a proof of reasoning powers in the animal in question :—No poultry, no rabbits, in the house, the cook called to the cat "Jim",—"Mew"—"Now Jim, I have nothing for master's dinner ; I saw you at the rabbit hole yesterday in the garden, go like a good Jim, and fetch me a young rabbit, and I will give you a dinner you like, a nice tit-bit of veal, Jim,"—In half an hour, the cook felt the cat rubbing himself against her ; an unusual thing for him to do, as he generally stood on his hind legs, and mewed—she looked down, he had a live rabbit in his mouth which he allowed her to take,—she said, "good Jim, but this is so small, do fetch me another," he turned and went out ; in a short time returned, she was not in the kitchen, he followed her into the larder and laid a live rabbit at her feet and mewed, she praised him and gave him the bit of veal he liked. A son of the same cat jumped once on an india-rubber hot water bottle, could not make it out, but always avoided it, wherever he might see it afterwards. A child disliking cats especially, and sitting on the sofa in its usual place, just as the cat was going to spring up ; seized the bottle, held it towards him exclaiming, "hot-water bottle, Jim, hot-water bottle," the cat looked at it for an instant, turned, left the room and the house, and never entered it again.—F. O. Morris, Nunburnholme Rectory, York.

The Bee Eater.—I had this morning the great satisfaction of meeting with what few naturalists have seen in this country, viz :—*Merops apiaster*, the Bee Eater. It was sitting in company with one or two flycatchers, on a fence by the roadside, about two miles from this place, watching for and catching the insects as they passed.

It was only three or four yards from me when I observed it, and mistook it at first for a kingfisher, at the same time thinking the position most unusual for that bird, as there was no water near. It left me but an instant in doubt as to its genus, when it darted like a swallow into the air, after an insect glittering like a gem in the sun's rays, and then selected for itself another perch in a willow close by. I know the bird well from stuffed specimens and could not be mistaken as to its identity, after I had witnessed its habit. I am induced to forward you this communication as I know that many of your readers are interested in such occurrences.—Geo. B. Wollaston, Chiselhurst, Kent, S.E., May 24th, 1865.

ARRIVALS OF SUMMER MIGRANTS.

The passage-birds have come over this year in the following order :—

Wheatear		April 8th.
Willow Warbler		,, 9th.
Chiffchaff		,, 10th.
Redstart		,, 11th.
Treelark		,, 12th.
Blackcap	(North Wales)	,, 15th.
Swallow	Do.	,, 15th.
Whitethroat	Do.	,, 15th.
Cuckoo	Do.	,, 14th.
Woodwren		,, 17th.
Yellow Wagtail		,, 21st.
Lesser Whitethroat	(York)	,, 22nd.
Garden Warbler		May 1st.
Flycatcher		,, 6th.

These are earlier dates than the average of the last ten years.—Peter Inchbald, Storthes Hall, May 15th, 1865.

Snakes.—January 14th, 1865. No mail yet. River nearly dry they tell me, so the steamer cannot get up, as our boats, though of Yankee construction, are not quite up to what Lincoln said *officially* of the American navy, that it "went up creeks everywhar the graound war a little daamp." Apparently the world is getting baked, for no proper rains have fallen for a year or two. Where is all the water gone to that has evaporated this last year and a half? Across the Magdalena, not very far from here, men can wade, wetting themselves only half-way up the thigh; when will it stop I wonder? My poor cattle are catching it, I am afraid using their tallow up to live on. There is no entomology going on at present, it seems to me that for two years with long dry seasons the creatures have been much discouraged. Since 1862, I see very little movement among the butterflies at any rate, and other collectors report the same thing. Some day the rain will return and we shall have abundance, to your satisfaction. In more plenty are snakes, the drought agrees with them; I lost one of my best mules lately from a bite—and a neighbour of mine lost ten bullocks by one rattlesnake. And the villains bite men also; I have been trying the spirituous remedy with success. The last four victims who were bitten have all been saved by making them drunk with *aguardiente*, rum flavoured with aniseed, the nectar of the new granadian olympus, and as nasty as absinthe which it much resembles to my thinking. It is a great discovery, for it has the advantage of being procurable everywhere, and that the patients are only too willing to swallow it; I believe that every one of the four mentioned would have gone under, but for the timely application of the liquor to their nervous system.—Henry Birchall, Bogotà.

SUMMER RAMBLES ON THE ORME'S HEAD, LLANDUDNO.—No. III.

In our third and last ramble we will visit the shore, before ascending the headland. Two of the Plumbaginaceæ, *Statice Limonium*, and *S. spathulata*, are met with on the rock-bound shore of the Orme, one growing on the rock itself, the other flourishing in salt-pits on the coast. I was glad to meet with *S. spathulata* in some abundance, as it is usually considered somewhat local in its distribution. It may be easily recognised by its bi-nervous leaves and dwarfish habit. Here too is a profusion of a rare and local plant, *Erodium maritimum*, that chiefly occurs in the south of England. The petals of this plant are very

minute, and sometimes altogether wanting. It is growing with the commoner *Erodium*, which has white as well as pink flowers. Fennel and Samphire both abound on the rocks which are exposed to the influence of the sea. The glow-worm, *Lampyris noctiluca*, is plentiful on a grassy slope near the baths. I took both the male and female, both are furnished with the light; in the male it is confined to two luminous spots at the tip of the abdomen; in the female it extends over three rings. In the larva state glow-worms feed on snails, pursuing them even into their shells; the larva has also the luminous property in a slight degree. I found the glow-worms most abundant where the Pellitory grew, which was much preyed on by a small mollusk of the genus *Planorbis*. *Asplenium marinum*, with its fine luxuriant fronds, and *Botrychium Lunaria* were the best of the ferns I noticed on the Orme. The swifts, *Hirundo Apus*, build in the cliffs immediately overhanging the sea, and they may be seen in the summer nights, wheeling in everlasting circles round the headland, screaming for very joy, as they race and chase each other over the sea. The pretty wood tiger moth, *Nemeophila plantaginis*, I took among hazels on the slope facing the church; as its specific name implies it feeds on the plantain. Plants of the common Ragwort were completely unleaved by the larvæ of *Callimorpha Jacobææ*; it was not unusual on a hot day to see the caterpillars coursing across the sands, either suffering from ichneumons, or seeking some suitable spot wherein to undergo their transformations. The yellow-wort, *Chlora perfoliata*, that constant tenant of dry calcareous hills, was hereflowering in perfection, its fine bloom and glaucous foliage causing it to vie with many an exotic in garden cultivation. With it, and growing on the same dry slopes, was the rare *Hypochœris maculata*, the purple-blotched leaves and large lemon-colored head of flowers of which rendered it very conspicuous. The Ground-Ivy, *Glechoma hederacea*, was infested with the galls of one of the Cynipidæ, *Aulax glechomatis*. The galls are prettily tinted with red, and about the size of a cherry. They are many-chambered. I had the pleasure in May of the succeeding year, of seeing the tenants emerge, and I furnished an account of them to the *Intelligencer*. Other galls I found on the leaf-stalks of *Rosa spinosissima*, as also on the calyx, which was distorted thereby into the most unnatural proportions. These galls yielded me another cynips. The Horseshoe Vetch, *Hippocrepis comosa*, a commonplant on the downs in the south of England, occurs on ledges of the upper rocks facing the church. In conclusion, I must not forget to mention the madder *(Rubia peregrina)* which grows on the Orme, as this is probably its most northern limit in our Island. Here it really grows most luxuriantly, flowering plentifully, and doubtless fruiting in some of the sunnier nooks and corners in which it grows. I met with it as lately said, in fine black fruit, in the Isle of Wight, in January, 1864.—PETER INCHBALD, Storthes Hall, May 2, 1865.

Curious locality for Potamogeton natans.—Mr. Jno. T. Aspinall, engineer at Messrs. Berry and Turner's mill, near this town, has had this plant growing in a cistern which is built over the top of the engine house, for more than a year. The plant was first discovered last summer, and caused some astonishment from its peculiar *locale*. The water is pumped into this cistern by a force-pump, which raises it from a large covered tank situated at the opposite end of the mill, and which is itself supplied from the canal by a series of pot drainage pipes some hundreds of yards in length. The plant has not yet been detected in the canal, and the most probable solution of its spontaneous appearance here is that some seeds of it having got mixed with the fleece whilst washing sheep, have by some means got into the ground-tank, have then been pumped up into the cistern, where they have taken root, and are now in a flourishing condition. The cistern contains usually a depth of from two feet to two feet six inches of water.—H, Huddersfield, May, 1865.

Original Articles.

THE ENEMIES OF THE LARVAL FROG AND TOAD.

By J. Hepworth.

(Continued from Vol. I. page 344.)

We have now glanced at a few of their insect foes. Many more could be added to the list; but those already given may serve to show how the numbers of these are thinned by aquatic insects.

We will now turn our attention to their vertebrate enemies (aquatic) commencing with fish as most lowly organised. Many fish feed largely upon them, as the Stickle-back, bearded Loach, and others.

Stickle-backs appear to be very destructive to them, especially for some weeks after their extrusion from the egg; that in my possession at the time before alluded to, destroyed vast quantities of them, and when they became too large to be easily destroyed, he pursued them most relentlessly whenever they emerged from the crevices of the rock-work, and rarely failed in obtaining a portion of their tails. So great were his tail-snipping propensities that it became a matter of surprise to see one without a notched or serrate tail.

Any one unacquainted with Natural History might have supposed that I had found a new species, or at least a very noteworthy variety. It was not a little amusing to sit and watch this little tyrant of our ponds pursuing them to and fro, allowing them not a moment's peace till they are once more safely secreted amid the rock-work.

This little warrior belongs to that great division of fishes called *acanthopterygii* or spine-finned—all the members of which have one or more fin-rays *undivided* and stiff; forming in many cases formidable weapons of offence and defence. It is included in the *Gurnard* tribe, or *Trigliдæ*, to which group also belongs the Flying-fish.

The common stickle-back of our ponds and becks has three of these spines in the dorsal fin; the ventral fins are represented by a pair of strong, rigid, spines, which he well knows how to use. When irritated or alarmed the spines both dorsal and ventral are stiffly erected, and are then formidable weapons, especially when wielded by so pugnacious a little creature. At other times they are inclined to the body.

This small fish is perhaps still more interesting from the fact that it is one of those few fishes that are known to make a provision for, and pay some regard to, their young. The male builds a nest for the reception of the spawn, and guards it with the utmost care, attacking all creatures intruding upon its immediate locality ; it is also said to watch over the young for some time after their extrusion from the egg ; I have never been able to witness this interesting sight, though I have kept this fish for a considerable length of time.

The *Gobetus barbatula*, or bearded loach belongs to the soft-finned fishes —*Malacopterygii*. It acquires its English appellative of *bearded* loach from the *tentacula* with which its mouth is adorned; these are six in number, one at each corner of the mouth, and four before the nose on the upper lip. These appendages are possessed by many of the *Cyprinidæ*, to which family this fish belongs. Its ventral fins form a funnel shaped disc which acts as a kind of sucker, by means of which it is enabled to adhere in almost any position to submerged bodies. Its mouth is also peculiar—the jaws being united by a membrane, and toothless ; it is in fact a protrusile tube. It however possesses powerful pharyngeal teeth.

The method these fish seem to employ in destroying tadpoles is that of crushing them against the rock, and then sucking out the juices of the interior. At other times they draw them into the mouth, and after bruising shoot them forth again. This action they frequently repeat till the creature is destroyed.

It is a very curious and interesting sight to see one of these creatures struggling with a wriggling worm, striking and splashing about in all directions, in the endeavour to force it down its somewhat narrow gullet. But though these sights are interesting, yet this habit of plunging and splashing is no recommendation to this fish, as a specimen for the aquarium ; as it is constantly disturbing the water, uprooting favourite plants, and rendering the aquarium untidy.

Among their most relentless foes, may be included the members of the genus *Triton* a group of animals belonging to a lizard-like section of *Batrachia* —the *Urodela*. The triton, eft, newt, or asker is very destructive to them in their early life ; but is less so as they acquire strength and dexterity.

Newts are among those unfortunate creatures that suffer through an evil name, one, moreover, which is unjustly placed upon them. They are almost universally believed to be venomous though the readers of "*The Naturalist*" need scarcely be informed that this belief is altogether unfounded ; as they

are among the most harmless creatures known. Some critical naturalist, glancing his eye over this, may, perhaps, be inclined to say that the denial of their venomous powers is unnecessary, as no man of any intelligence believes such to be the case. If such there be, I hope he will excuse the trivial (?) statement when I inform him that I have known village pastors, and "gentlemen of the first water," who do not scruple to express their belief in this, to him, absurd notion. The treatment of these poor animals from young and old, from the unlearned, and, I am sorry to be compelled to add, the learned too, strongly bears out the truth of the vulgar but strong proverb "Give a dog a bad name and hang him." No manner of torture is deemed too severe for one so vile as he. In country villages I have heard of, and in some instances been in a manner compelled to witness, deeds of cruelty exercised upon these helpless and harmless creatures, that were worthy of a Nero ; and compared to which the horrors of the Spanish Inquisition were acts of mercy. Nor are these outrages perpetrated in secret—they are enacted in presence of an admiring parent, under the approving nod of the squire, or, before the silently acquiescing pastor. Alas for the boasted intelligence of the 19th century !

Though the tritons when viewed through an undistorted medium are really elegant and interesting creatures, yet, they seem to have been little studied. There seems to be doubt even as to the number of British species ; some authors making four, some three, and others again only two.*

At the season of love the male is endowed with a serrate or sinuous dorsal ridge of skin ; stretching from the head to the end of the tail. In *T. palustris* this membrane is enormously developed, giving him a most striking appearance ; as the season comes to a close the appendage is gradually absorbed. Those who doubt the appropriateness of the word elegant, as applied to these creatures, should visit some neighbouring pond and spend an hour watching their motions in the water. It is more than probable that any one so doing would come away with juster and more enlightened notions of their claim to such titles as "beautiful and elegant," than any amount of reading could give him. I have spent—wasted, if you please, many hours watching them in their native haunts, and I can truly affirm, that there are few motions more graceful than those of the newt when gliding about the waters. The motions of the male as he disports himself before the female,

* Fleming gives three but states that *T. vulgaris*, is "by many considered as identical with *T. aquaticus*." Since writing the above I have had the pleasure of reading Bell's admirable book on British reptiles, and it would seem from his statements that four distinct species have been made out.

are of the most *elegant* and *graceful* kind. He is the very beau-ideal of a gallant lover, as he throws himself before her, to attract her attention, and goes through the most complex evolutions to win her regards. At such times he will throw his tail into the form of the head of the Bishop's crook and give it a kind of undulating motion, the apparent wave travelling from the root to the tip. This is done with great rapidity, and forms a very pleasing sight. In the aquarium newts are a continual source of amusement and instruction.

Their principal food consists of worms and tadpoles, though fish not unfrequently fall victims to their rapacity. Instances of this kind have occurred more than once under my own eyes ; one case greatly amused me. One day as I sat watching the warty newt (a specimen near seven inches long, now in *good* spirits) ; I saw him seize a well-grown stickle-back by the caudal extremity, and commence swallowing him with the utmost nonchalence, The operation went on swimmingly and his speedy dispatch seemed certain. The work, however when about half completed came to a dead stand—On looking more closely to ascertain the cause of this unusual pause, I saw the ventral spines stiffly erected and pressed close to the lips of the newt. All endeavours to get the lips over them were futile. After struggling thus hopelessly for a full quarter of an hour ; he rapidly disgorged it, and examined it attentively for some minutes ; then, as if suddenly struck with a bright idea, he seized the fish once more, but this time *by the head*, and began the swallowing a second time, and soon completed it without further trouble, for on reaching the spines they were now easily pressed down and thus the difficulty vanished. Was the difficulty overcome by chance, or had he, as it seemed to me he had, really *studied* the problem, and found out the proper solution ?

A few words on the manner in which food is swallowed by these and other *Batrachia* may not be out of place. The food of these animals does not undergo any mastication in the mouth ; but is swallowed entire and alive. The whole process of mastication and assimilation is carried on within the stomach and intestines. In the adult state they all seem to prefer living prey ; indeed, as a general rule they will not touch anything that does not by its motions betray signs of life. They appear to be little guided by the sense of smell ; for although they may often be seen hunting the bottoms of ponds, or the aquarium, yet on coming in contact with a worm or other soft body, they will push it about with the nose ; evidently with the intention *not of smelling* what it is, but of *seeing* whether this disturbance produces *motion*. If no movement takes place they will almost invariably

pass on ; but, on the contrary should motion result, they will certainly attempt a capture, whether the object be a dainty worm, or an insipid boot-lace.

The newt having secured its prey by a sudden snapping movement, swallows it by relaxing its grip, and, at the same instant, rapidly darting forward the head, when by the law of inertia, the animal glides further within the jaws of death ; for truly, its " throat is an open sepulchre." By repeating this action more or less frequently according to the length and power of the creature, the act of swallowing is gradually accomplished. The nature and form of their teeth, which are distinctly recurved, materially assists in preventing the escape of any luckless creature that may be caught.

The eye of the newt though very pretty, would not appear to be one of the most perfect organs of vision. They have little or no power of *rolling* the eye from side to side, or up and down—a power that confers innumerable benefits upon its possessor. The consequence of this fixity of the eye is that if a creature move ever so little to the right, or left, it is carried beyond the range of vision, and is therefore safe from its attack. It is a most ludicrous sight to see a newt snapping blindly at passing tadpoles ; and, to witness his look of amazement on finding his teeth clash together instead of enclosing the juicy body of his intended victim.

This imperfection of vision, if it may be so termed, is the reason why I stated previously that the newt became less destructive to the larvæ of the frog and toad, as they acquired strength and dexterity sufficient to enable them to dart rapidly through the water.

Wakefield, March 30th, 1865.

SPONTANEOUS EXOTICS.

By James Britten.

(Continued from Vol. I., page 360.)

Order XIX.—Geraniaceæ.

Geranium macrorhizum, L. There is a specimen of this plant in the British herbarium at the British Museum, which bears the following note :— " Growing in great abundance on the walls at the North Hall, called by the common people Valery Ann ; Rev. Aaron Neck, S. Mary Church, Newton

Abbot, Devon, Sept. 1803." Mr. Watson suggests that this may have been the species recorded from Cumberland as *G. nodosum*, and *G. angulatum*. See *Cyb. iii*, 481. I have no other note of its occurrence in Britain.

G. nodosum, Huds. This plant, which was recorded in the earlier botanical works as a native of this country, has since been excluded from that honour; not being known to exist in any station where it is even apparently indigenous. It was recorded in the *Botanist's Guide* as occuring "in a hilly situation between Hatfield and Welwyn," in Hertfordshire, by the Rev. Dr. Abbot, but subsequent search has failed to discover it in that locality. See *Flora Hertfordiensis p.* 53. Mr. Grugeon, in a paper read before the Society of Amateur Botanists, June 3rd, 1863, notes its appearance on a sloping bank near Norbury Park, Surrey. In Yorkshire it appears to have been observed in several places, at Waterham, near Halifax, by Mr. S. Gibson, (*N. B. G*, 278.); at Leeds, by Mr. H. Denny, (*Ib.* 652); naturalised in a wood at Londesborough, H. Ibbotson; and in a wood at Kirklington, between Bedale and Ripon, M. Hebblethwaite, (*Supplement to Flora of Yorkshire, p.* 55); from the latter locality Mr. Syme states that he has specimens, (*E. B. ed.* 3, *ii.* 194); "subspontaneous or planted in Aske Wood, Ward," (*North Yorkshire, p.* 215). In Scotland, it is reported from "a wood near Scone Palace," in 1860, by Mr. John Sim, (*Phyt. v.* 159, *N.S.*) and it also occurs in a list of plants found in the Cumbraes, (*Phyt. vi.* 563, *N. S.*) This species was recorded from Cumberland, but the plant there found appears to have been *G. angulatum*; see next species: Mr. Watson thinks that it may have been *G. macrorhizum*. See *Cyb. iii.* 401. A native of Mexico.

G. angulatum, Curt. "Gathered a few years ago near Leathes water, Cumberland, pretty plentifully, but now, in consequence of the land having been cultivated, it is supposed to have disappeared from that spot, though probably it still grows in some adjacent situations." G. S. Gibson, in *Phyt. ii*, 376. *O.S.* From this station it was originally recorded as *G. nodosum*, and this mistake may have occurred in some of the localities above given for that species. For further particulars, and for a long discussion which arose upon this plant, see *Phyt. i.* 556, 588, and *ii.* 376, 430, *O.S.*

G. striatum, L. This species, like *G. nodosum*, has been placed among our British plants, and apparently with greater reason. "To all appearance it is truly wild in Jersey, occurring in many hedges, S. Martin's, Trinity, &c." G. Henslow, in *Phyt. ii.*, 635, *N.S.* Most of the recorded localities are in Devonshire and Cornwall, and it appears not impossible that the plant may

be really native in those counties. The plant seems to be well established near Penzance, where it was first observed by Dr. Penneck, who considered it "perfectly wild"; Mr. Watson observed it growing vigorously in two places near Penzance, but quite near to gardens (*N. B. G.*, 548); and Mr. Borrer states that "it has established itself in the avenue to Horneck Castle, near Penzance and in a neighbouring lane." (*Phyt. ii*, 431, *O.S.*) I have also seen a specimen from Bezaine Woods, Manaccan, near Helston, where it was well established in 1859. In Devonshire, this species is reported from one or two localities, especially near Clovelly, where it is stated by the Rev. T. F. Ravenshaw to be "naturalised" (*Flowering Plants and Ferns of Devonshire.*, *p.* 16); here Mr. Chapman also has observed it, "beneath a hedge, leading from the Pier at Clovelly to the entrance to Clovelly Court; about three plants found." *Phyt. vi.* 287. *N.S.* "I have specimens collected in Enys Wood, between Truro and Falmouth, where I am told it grew abundantly, and seemed quite naturalised. I observed it once in a hedge near here (Minehead), but it had evidently escaped from the cottage gardens near." J. G. in *Phyt. ii.* 446. *N.S.* "I send a specimen found near Barnstaple, Devon; but I think there is no doubt but that it originally escaped from a garden, although it had established itself in tolerable plenty on the banks of the Yeo, where I found it in 1845." M. H., in *Phyt. ii.* 414, *N.S.* It is also recorded from "Shrubberies at Sharpham and Bowden," in the *Flowering Plants of Devonshire*, as above quoted; and I have a note of its occurrence at Gunnis Lake, near Cullington. Mr. W. G. Smith informs me that it is plentiful in the Bitton Woods, near Teignmouth. I think that the circumstances relative to the appearance of this plant in the Peninsula province should be further investigated; as such investigation might tend towards establishing it as a native of that district. Mr. Borrer states, that he has seen a specimen "gathered by the Rev. Mr. Billingsley, in a footpath through a wood above the Wye, near English Bicknor; he saw but one plant. I have visited the place and hunted in vain." *Phyt. ii.* 431, *O.S.* In Surrey, it has occurred at Streatham, "in a hedge near the common, and also near the White Lion." (*London Flora*, *p.* 304); and the Rev. W. M. Hind writes, that it is "well established on a hedgebank at Pinner Hill," Middlesex. In Yorkshire, *G. striatum* is reported to be "naturalised in Aske woods near Richmond," by Messrs. James Ward and G. Maw, (*Supplement to the Flora of Yorkshire*, *p.* 54.) In Cumberland it is "said to have been found between Flimsby and Workington, opposite the first gate after the road has turned from the valley of the Derwent to follow the coast towards Maryport." (Joseph Woods, in

the *Companion to the Botanical Magazine*, *i.* 296, as quoted in *N. B. G.*, 661); and Mr. G. S. Gibson also records it from the same neighbourhood, "on the coast, plentifully, and apparently wild." *Phyt. ii.* 376, *O.S.* The plant has been found in North Wales, "in a farm-yard close to the corn-stacks, at Trefrew, it was however, apparently well established." A. Irvine, in *Phyt. i.* 57, *N. S.* This species is known in gardens by the names of "Painted Lady" and "Pencilled Geranium." A native of Italy.

Order XXI.—Balsaminaceæ.

Impatiens parviflora, DC. This species, introduced within the last few years, has spread with great rapidity over the country, and is recorded from many localities. Its head-quarters are in the neighbourhood of London, where, especially in Surrey, it is very abundant: in this county it has occurred "near Nine Elms; abounds also on the Mortlake side of Kew Green. It appeared pretty well established about Battersea, but the works necessary for the Crystal Palace and West End Railway have probably exterminated it. It appeared also by the riverside near Kew;" *Phyt. iii.* 335, 339. *N.S.*; in the neighbourhood of the latter locality I collected it in 1864. The plant is also recorded from "Wandsworth and Wimbledon" (*E. B.*, *ed.* 3., *ii.* 218); in *H. B. P.* 753, it is stated to be "naturalised about Mortlake," and Mr. Trimen, in *Journal of Botany*, *ii.* 94, observes "I gathered *I. parviflora* on a bank at Mickleham in 1861." In Middlesex, I observed it in 1858-61 in some plenty in the grounds of Chelsea Hospital, where it was well established, but subsequently destroyed in the alterations; I have also seen it in an old garden at Brompton; and Mr. J. C. Melvill writes, that it is "a very frequent weed about Kensington, sometimes covering every flower-bed in a garden." In Essex, *I. parviflora* is recorded by Mr. G. S. Gibson from "Stanstead and Fyfield" (*Flora of Essex*, 65.); and it is abundant and well established in the garden of Church End Farm, Runwell, where it certainly was not introduced for ornamental purposes. In Cambridgeshire, this plant occurs in several places: "plentiful in a lane leading to the fen at Sawston, in 1856; in the village of Duxford, *Rev. W. W. Newbould:* by the road to Chesterton, *Mr. W. Walton, M.A.*," *Flora of Cambridgeshire*, 49. It escaped from Mr. Borrer's garden at Henfield, Sussex, and "thoroughly established itself upon a turfy bank and in two adjacent timber yards, filling up the interstices between the timber." See *Phyt. iv.* 142, *N.S.* In the Isle of Wight, this plant was observed by Mr. Irvine "near Ryde, in 1857;" *Phyt. iii.* 340, *N. S.*: here it is said to be "partially naturalised"

(H. B. P., 753); and the locality is further described as being "on the road to Upton." *Phyt. v.* 252, *N.S.* In Lancashire, it occurred in small quantity "in a paddock near Sedforth Church (near Liverpool), and abundantly in a small yard and about a ruined pigstye ; also where a boiler for steaming food for cattle formerly stood, at no great distance from the first mentioned habitat." George Kirk, in *Phyt. iv.* 142, *N. S.* Mr. Grindon, in his *British and Garden Botany*, records it from " Yorkshire and Cheshire"*(p.* 115*)*; but no special localities are given. I have no record of its occurrence in Scotland or Ireland. In many of the above localities the plant was doubtless introduced with foreign seed : and when once established, it is not easily eradicated. Its Balsam-like flowers at once determine it : and a good figure of the plant is given in *E. B.*, *ed.* 3., *ii.*, *t. cccxv.* A native of Siberia, Russia, &c.

I. glanduligera, DC. This plant is not unfrequent in city gardens, where it is known by the name of " Tree Balsam." Mr. Irvine states that it manifests " some inclination to be one of our spontaneous productions at probably no very distant period" : and also remaks, "I have an anticipation that the *Impatiens* on the banks of the Colne, at Denham, near Uxbridge, is either the above , or *I. canadensis*, if there be any such species." *Phyt. vi.* 544, *N. S.* Mr. Grindon, also, in his *British and Garden Botany*, observes that it " is fast disseminating itself over the country" *(p.* 115.*)*; and has kindly given me the following additional information relative to its appearance. He writes, " I have seen it within the last four or five years in various parts of England ; and on enquiry who sowed it, or where it came from, no one knew. Many town gardens in Manchester and the neighbourhood contain it ; not sown, the people tell me. I have seen it under the same circumstances at the sea-side places on the coast of Lancashire, especially at Lytham, and also not far from the famous old habitat of the American *Œnothera biennis*. No one would grow the plant for its beauty, for it is a cumbersome and weedy thing at the best." I have no further note of its occurrence. A native of North America.

NOTES ON *HYPNUM ADUNCUM* AND ITS ALLIES.

By W. Wilson.

Hypnum Aduncum. Hedwig. This moss has a singular history, and its identification has long been a bryological puzzle. *H. aduncum* of *Bryologia Europæa* is now called *H. Wilsoni*, and after much research, Dr.

Schimper's latest and present conclusion is, that Hedwig had a form of *H. Kneiffii*, (*Bryol. Europ.*) as his example when he published his *H. aduncum* in the *Stirpes Cryptogamicæ*, (*vol.* 4, *t.* 24.)

Hooker and Taylor, (in *Muscol. Brit.*) regarded as the Hedwigian species, what is called *commutatum* var. *falcatum*, in *Bryol. Europ.* but which is now found to be a distinct species, whether *H. falcatum* of Bridel remains to be proved, and it is safest for the present to keep it separate, (*H. controversum*, *Wils. MSS.*)

For, at the most, Bridel's *H. falcatum* is only the aquatic form of the species, bearing as little resemblance to the type as *H. Vallisclausæ* does to *H. filicinum*; so that Bridel's description is essentially deficient as a guide to the knowledge of the species, and his right to a priority of the specific name becomes very questionable, and should not be insisted upon. He could not have had any clear knowledge of the species, if *H. commutatum* var. *falcatum* really belongs to it, and therefore *falcatum* must be treated as a trivial, (unimportant) name, to be rejected when no longer convenient, by the first intelligible describer of the species.

Dr. Swartz sent the moss now called *H. exannulatum* (*Bryol. Europ.*) to Dawson Turner, in 1801, under the name of *H. aduncum*, and there is a similar specimen from Swartz, in the Hookerian Herbarium, so named. Dawson Turner did not discover the error, and has marked, in his herbarium, the Hedwigian specimen as "var. *β. Musc. Hib.*", under the (probable) impression that the Swartzian specimen, was more like the moss figured by Dillenius, (*Hist. Musc. t. xxxvii. f.* 26.), which is assumed by Turner and Bridel, to be the original Linnæan species—(found by Dillenius "in *ericetis palustribus inter* West Wickham and Addington, *prope* Croydon, *copiosissime.*")

Fortunately there is an authentic specimen from Hedwig himself, in the *Turnerian Herbarium*, which removes all reasonable doubt and which well agrees with the figure given in the *Stirpes.*—It proves to be identical with the moss hitherto called *H. pellucidum*, *Wils. MSS.* (*H. vernicosum*, of Lindberg, and *H. aduncum* var. *tenue* of *Bryol. Europ.*)—It is *H. flavescens*, of Schleicher, in *Herb. Turner.*

This moss, with female flowers, was gathered many years ago by Mr. Borrer, in Amberley Wild Brook, Sussex, (called *H. aduncum*, var. in *Herb. Turner.*)—The male plant was once plentiful in Wybunberry Bog, Cheshire, but through the recent drainage, is now extinct. It is distinguished readily from all its allies by the very membranous pellucid plicate cauline leaves, inflated or saccate at the base.

Hypnum Sendneri. Schimper. This as a British moss, has hitherto been confounded, as it was long ago, by Dr. Swartz, with *Hypnum revolvens*, from which it is distinguished by its pinnatedly branched stems, and dioicous inflorescence.—In character it is intermediate between *H. revolvens*, and *H. Wilsoni*, and is probably frequent in Britain. Fertile specimens are to be seen in the *Hookerian Herbarium*, gathered by Mr. Borrer, in Amberley Bog, Sussex, in 1813. It occurs on Hale Moss, Cheshire, and near Southport, (female plants only, and consequently barren), and is recommended to the notice of field-bryologists.

Hypnum Wilsoni. Schimper. *H. aduncum*, *Bryol. Europ.* In June 1858, this moss was rather plentiful, with fruit, near Ainsdale, but has not since been found except in a barren state. It is a larger moss than *H. Sendneri*, with fewer branches, and the leaves less crowded, and of lax texture at the base.

It is not accurately figured in *Bryol. Europ.*, as to the enlarged cellules there represented at the marginal base of the leaf: indeed (judging from a specimen of *H. aduncum*, received from Dr. Schimper consisting partly of this, and partly of *H. exannulatum*,) it would seem that the figure 5. *b.* has been inadvertently drawn from a leaf of *H. exannulatum*; for in Dr. Schimper's own specimen of *aduncum*, the alar cellules are usually less conspicuous than in the Southport specimens, and the nerve also thinner.

In Dr. Schimper's specimen the leaves of *H. aduncum* (*Wilsoni*) though not longer than those of *exannulatum*, are more than twice as wide, more concave, and quite destitute of striæ, both in a wet and in a dry state; they are ovate-lanceolate (those of *exannulatum* being linear-lanceolate and less falcate) but except in the thinner nerve, and less prolonged acuminated summit, not obviously different from the Southport moss;—at fig. 5. and 6. in *Bryol. Europ.*, the leaf is represented too wide at the base, and the leaf is consequently given as ovate-accuminate, instead of ovate-lanceolate, having the widest part considerably above the base, as in *H. Sendneri*, the leaves of which are scarcely to be distinguished from those of *Wilsoni*, except in being usually narrower, more crowded, and with narrower and more linear areolation towards the base, where the enlarged cellules (so conspicuous in *H. exannulatum*,) are usually wanting or obsolete.

Hypnum exannulatum. *Bryol. Europ.* This moss is described in *Bryol. Brit.* under the name of *H. aduncum*, first found with ripe fruit on Baguley Moor, in April 1831, and was then, and at the time of the publication of *Bryol. Brit.*, the only known moss in Britain which could be well referred

to Hedwig's *H. aduncum*, and there was the great authority of Dr. Swartz for so naming it. In *Bryol. Europ.*, the leaves are unhappily described as "haud plicata"; for if not actually plicate, as in *H. uncinatum*, with which it is contrasted; they are very remarkably striate, and by this obvious mark the moss may always, in the field, be easily recognised. But it will be seen that even if no mistake had occurred as to this species, the *Bryol. Europ.*, would not have helped in any degree to the determination of Hedwig's *H. aduncum*, every one being equally in the dark on that subject.

In the *Hookerian Herbarium* one of the specimens from Dr. Swartz, named *H. aduncum*, is only a form of *H. fluitans*, having monoicous inflorescence, a character not attended to in those days, and only brought into its proper use by the authors of *Bryol. Europ.*, as the guiding star in the determination of closely allied species. This specimen seems to have been taken by Dawson Turner as the typical form of *aduncum*; for there is a drawing of the leaf in the margin of his own copy of *Musc. Hib.*, which has most probably been taken from this very specimen.

There is in the *Turnerian Herbarium*, a beautiful red, narrow-leaved, variety of *H. exannulatum*, from Ben Nevis, (by Mr. Borrer, 1810,) called "*H. Hookeri*, n. sp. *Turn. MSS.*"

Reports of Societies.

Dudley and Midland Geological Society.—On Tuesday, April 25th, a Field meeting was held on Cannock Chase, for the purpose of examining the new sinking and colliery workings, in connection with the Northern portion of the South Staffordshire Coalfield. About sixty members were present. The second Field meeting was held on May 16th, in the Southern portion of the coalfield, where also, a considerable number of new mines are being opened. The party was conveyed by special train, and was more numerous than at the April meeting. The botanists had the able guidance of the Rev. J. H. Thompson, who gave an address on one of the hills, on the Geology and Botany of the neighbourhood. New species of *Trilobite*, *Carpolite*, and *Cystidea*, were exhibited at a recent meeting of the Society. The next meeting is fixed for June 20th, at Oxford.

High Wycombe Natural History Society. The members met at 1-30 on Saturday, 20th May, for their second field day to Whittington Park and the adjoining district. It forms the highest ground in the south of the county, and from its diversified character, consisting of heath, bog and woodland, is the habitat of many species of animals and plants. It is not a little remarkable that land so elevated should nevertheless in some portions be so marshy as to be unable to sustain the weight of the body in walking over it: this moisture collects and runs into a deep pit known as the Swilly Hole, disappearing in an aperture at the bottom and thus communicating with some subterranean stream or spring.

The bog is the home of the *Equisetæ* or Horse Tails, two species of which exist in great profusion, viz., *E. Telmeteia* and *E. sylvatica*. The Bogbean, *Menyanthes trifoliata*, an exquisite wild flower, is also there. and ferns are innumerable,—*Lastrea spinulosa*, *Polystichum aculeatum*, *Athyrium filix-fœmina*, *Blechnum spicant*, and others. Near the Swilly Hole the Red Currant *Ribes rubrum* grows very plentifully : this is not usually supposed to be indigenous, if not, it is a matter of great curiosity as to how it was here introduced. In a neighbouring field *Orchis morio*, and *O. maculata* were abundant ; the former closely resembles *O. masc*ula, but may be distinguished by the greater number of spots on the lip, and the green stripes on the upper petals which closely resemble wings ; a pink variety was not uncommon. *Cynoglossum officinale* was also seen near ; this plant has a curious smell of mice. *Ornithogalum umbellatum*, a rare plant, and many others were noticed. Several specimens of microscopic fungi were pointed out by the President. Beetles were very numerous, among which may be named a Click Beetle *Agriotes obscurus*, *Phyllobius uniformis*, *Byrrhus pillula*, &c. The members paid a short but interesting visit to the Tertiary sands which are exposed in a pit at Lane End. Here the alternate beds of sands and laminated clays appear to belong to the Middle Eocene formation : the orange-coloured sands and the clays bear a strong resemblance to the bright coloured ferruginous sands and the white sands laminated with pipe clay which characterise the Bracklesham (Middle Bagshot) beds in other parts of the country. The Rev. E. Hodges, Vicar of Lane End, very kindly brought out a collection of local fossils and gave much information on the kind and character of the sands which are here so numerous. On the return home the rare *Ranunculus parviflorus*, was found on Booker Common.—Hy. Ullyett, Hon. Secretary.

News.

Death of Charles Waterton, Esq.—This venerable naturalist breathed his last on Saturday, the 27th May, at his residence, Walton Hall, near Wakefield, at the age of 83. Passing the earliest and the latest years of his life in this charming "island home" in Yorkshire, the prime of his manhood was spent in the everlasting forests of the tropical portion of South America, "wandering," as he delighted to call it, at his own sweet will, and often for considerable periods entirely alone, in the pursuit of objects of natural history. What he has done for his favourite study, his books speak for him ; as a hard-working Field Naturalist, and as a patient and unremitting observer and recorder of facts, he has never been surpassed, the fruits of his labour enriching many a volume of periodical Natural History Literature. It is a matter of mournful regret that he who has had so many hair-breadth escapes should at last have his end hastened by an accidental fall, but such was the case ; of active temperament he was always engaged in outdoor occupation in his garden or grounds, and on the 26th, while carrying a piece of wood he fell and injured himself so severely that he died within a very few hours. He had written his own epitaph some years ago in Latin, "Pray for the soul of Charles Waterton, born June, 1782, died — whose wearied bones rest here."

Ornithological :—From a Scotch paper we learn that a pair of golden eagles, *Falco Chyrsaëtos*, were shot by the gamekeeper at Dalnawillan Lodge, Strathmore ; Mr. Henry Hadfield also announces in the *Zoologist* (9604,) that one of these fine birds passed over Shanklin in the Isle of Wight, during the month of March. The same gentleman also records the occurrence of the Blue-breasted warbler, *Sylvia Suecica*, in the Isle of Wight with a description of the bird and some interesting observations on its habits from which we extract the

following :—"Its flight is more sudden and rapid than that of the redbreast, and I observed the tail often raised like that of the wren, particularly when pursued or excited, as it often was by the robins, and though it did not court the attack it was ever ready for the fray, and with outstretched neck and upraised tail awaiting the attack, it fought desperately, falling with its assailant to the ground, where it struggled on for a second or two, but on taking wing seemed none the worse for the encounter, and, perching on a tree, renewed its song, which is very similar to that of the redbreast, though not so loud, nor is it so prolonged. When singing the bill is widely opened, the wings drooping and vibrating with the tail, and in hopping among the branches the wings were in constant motion, as is observed in the hedge-sparrow. I saw it hopping among the decayed leaves in search of worms, and noticed its beak crammed with them ; it was also seen to alight on a path, along which it swiftly ran, like a wagtail. Though so restless a bird, it did not wander forty yards from the spot where first seen during the hour or more I observed it, and its song was constantly renewed. It is not only smaller than the redbreast, but a neater looking bird, the plumage being more even and close. Chin and upper part of the throat of a grayish white, tinged with yellow ; this gorget-like patch extends to the cheeks and over the bill, which is black, and longer and straighter than the redbreast's, but not, I think, so stout, nor is the eye so full. Breast of a dull bluish colour, longitudinally streaked with reddish brown, and slightly spotted and shaded with a dull white ; the under parts of the latter colour. Under part of the tail of a darkish brown ; the external feathers whitish. Head and back of a grayish brown. Wings reddish brown ; tail darker. The head proportionally larger than that of the redbreast. The plumage has an imperfect appearance, the colours not being well defined, as in the young robin."

Entomological:—In the *Entomologist's Monthly Magazine* for June, we find recorded the capture of two species of Coleoptera new to Britain, Mr. D. Sharp has taken *Elmis cupreus*, near Edinburgh ; he thinks this species may be confounded in British collections with *E. nitens* from which it differs by being "rather smaller, with oblique impressions on the thorax, the posterior angles of which are not so much directed outwards ; the striæ of the elytra are also more strongly punctate, and the alternate interstices elevated." Mr. Sharp has also taken in the same neighbourhood *Olophrum fuscum*. Grav. In the same number, Mr. E. A. Eaton also notes the occurrence of female specimens of the imago of *Clöen Rhodani*, "under stones which were lying partially exposed in a stream near Cambridge. When lifted up into the air, they crawled down again to the surface ; and those which were closely observed, after feeling about with their fore-legs, voluntarily entered the water." The Rev. E. Horton records the capture of a good specimen of *Xylina conspicillaris* taken at rest on a small oak in a wood near Worcester. Mr. William Cole records the capture of a pair of *Notodonta carmelita*, on the Bishop's palings at West Wickham.

Observations.

Human Remains from Franconia.—It may possibly interest such of your readers as are students of that beautiful science, Geology, to be informed that Dr. Haupt, keeper of the museum of the Clerical Seminary at Bamberg, (Franconia), has lately discovered in the immediate vicinity of that city, a stratum with human remains, lying between ten and fourteen feet beneath the present surface of the soil, and overlaid by a bed of peat covered with alluvial sands. The stratum in question is a black, bituminous earth, filled with bones of bovine and cervine animals. Amidst them lie scattered fragments of pottery and glass ;

human calvaria and bones ; some bronze objects ; two large idols of Rengier sandstone, of very rude and unskilful workmanship, one having but four fingers on each hand ; and two large trunks of trees excavated into canoes, and still containing part of their ballast, consisting of fragments of rocks known to occur round Bamberg. These canoes are the best proof of an ancient lake-basin, whose banks had been inhabited, having once occupied what is at present the valley of the Main. Many of the fossil bones in question are sawn asunder lengthways. Among them have been found a *Strombus* of a recent species, and a perforated *Cardium edule*, (probably procured in the way of exchange-trade); and, among other vegetable remains, a great number of hazel nuts. Subsequent diggings have proved the strata in question to be very extensive, and to be everywhere immediately overlaid by peat, and, above this, by alluvial sands. Can this be the prelude to the discovery of the long-sought anthropolite?--E. Foxton Firby, M.R.A.S. &c., Grewelthorpe.

Meles Taxus in Hackfall, Grewelthorpe.—I am glad to be able to record in the pages of the "Naturalist," that the Badger, a very innocuous but much maligned and persecuted carnivorous mammal, is rather prevalent in this part of the country, where it seems to enjoy its exemption from the persecution under which the rest of its brethren are elsewhere suffering, though there can be no doubt that its rapid disappearance from various localities in which it had, previously, been frequently seen, is mainly to be attributed to the persistent cruelty to which it is almost everywhere subjected. The geographical distribution of the Badger in this country has, of late, become extremely circumscribed, and unless local preservative measures are instituted for its protection, I am afraid the date of its final extinction from amongst us is not far distant. In former years the Badger was far more abundant in Hackfall, a beautiful wooded demesne belonging to Earl de Grey and Ripon, through which the river Ure winds its tortuous course, than what it is at the present day. Some three or four years since, (the precise date has totally escaped my memory) one of the keepers succeeded in capturing, by means of traps placed in the vicinity of their subterranean excavations, from whence they issue on crepuscularian errands along the wooded banks of the stream, two remarkably fine specimens of *Meles Taxus*. Since then, I believe, the keepers have been instructed to preserve them carefully in their present retired haunts in Hackfall, where it is to be hoped they will long remain as "living representatives amongst our indigenous mammalia." The Badger is said to dig up wasp's nests, and Buffon, who mentions the epicurean propensity, attributes it to the animal's fondness for honey, but as wasps do not collect honey, what becomes of the great French naturalist's inference ? A short time since I observed some black varieties of the common wild rabbit *(Lepus cuniculus)* in a wood near Azerley, and last summer they might have been seen abundantly in the neighbourhood of Laverton, both villages being only about two miles from the place where I reside.—Edwin Foxton-Firby, M.R.C.S., Grewelthorpe.

Albino Skylark.—On the 5th inst., when taking a constitutional walk with a friend along the banks of the Ouse, we had occasion to cross the Ings at Riccall, a village about three miles north of Selby, where we discovered the nest of a skylark *Alauda arvensis* ; it contained four young ones, and to my surprise one of them was perfectly white with pink eyes, a beautiful little creature, which seemed very happy with its three companions all the usual colour. It appeared to me they would be three or four days before they would take off. My friend who lives near the place, assures me he will exert himself to secure and keep alive the white one until it is sufficiently feathered to be stuffed side by side with one of its companions.—T. R., Wakefield.

Scarcity of Swallows.—During a recent visit to Cobham in Surrey, I observed a remarkable scarcity of swallows, although not quite so apparent as it seems to be in the Rev. F. O. Morris's neighbourhood. There were also but few sand martins about Weybridge station, a famous locality for these birds.—W. R. Tate, 4, Grove Place, Denmark Hill, London, May 23rd, 1865.

Agrias Hewitsonii.—Know him well, saw one of the two when Mark was setting it ; and never one since. Came from Muso —But Fallon and wife are both dead, and nobody now to collect that wonderful district. Too far to go, and very bad climate, no hope for you at present ; will fraternise with the new fellows who have taken the mines, when they come and establish an entomology agency if possible.—Henry Birchall, Bogotà, January 14, 1865.

Spontaneous appearance of Glaucium phœnicum.—I was equally surprised and delighted to find this morning that a self-sown plant in my kitchen garden proves to be *Glaucium phœnicum.* (Crantz.) I had supposed it to be the more common *G. luteum* ; but as it has opened its flowers to-day, it has put in a claim to be considered of more importance than I at first supposed. I am quite at a loss to account for its appearance here—I have no example in my herbarium from which a stray seed could have found its way to my garden. Nor have I ever seen a specimen of the plant before, either living or dried.—It is at the corner of a bed in which some rhubarb seeds were sown last year ; and to which nothing has been done since save an occasional forking over, Two flowers have already opened ; and there is promise of several more soon displaying their beautiful spotted petals ; so that I hope to be able to save seed for future propogation and distribution.—W. M. Hind, The Parsonage, Pinner, Watford.

Original Articles.

MATERIALS FOR A FLORA OF WAKEFIELD AND ITS NEIGHBOURHOOD.

By T. W. Gissing.

(Continued from page 34.)

Order—LINACEÆ.

Linum. *Linn.* Flax.

L. usitatissimum, L. Common Flax. A. July. Woolley Edge. An escape.

L. catharticum, L. Purging Flax. A. June—September. Common.

Order—MALVACEÆ.

Malva. *Linn.* Mallow.

M. moschata, L. Musk Mallow. P. July—September. Chevet, Woolley, Garforth.

M. sylvestris, L. Common Mallow. P. June—October. Common.

M. rotundifolia, L. Dwarf Mallow. P. June—October. Heath, Pontefract, Hiendley, Havercroft, &c.

ORDER—HYPERICACEÆ.

HYPERICUM. *Linn.* St. John's Wort.

H. perforatum, L. Common St. John's Wort. P. July—October, Common.

H. quadrangulum, L. Square-stalked St. John's Wort. P. July—September. By the Canal at Stanley. Banks of Barnsley Canal, &c.

H. humifusum, L. Trailing St. John's Wort. P. July—September. Heath, Hessel near Ackworth.

H. pulchrum, L. Small upright St. John's Wort. P. June—September. Pontefract, Woolley Edge, Ardsley, Garforth.

H. montanum, L. Mountain St. John's Wort. P. July—October. Garforth.

ORDER—ACERACEÆ.

ACER. *Linn.* Maple.

A. campestre, L. Common Maple. S. May—June. Frequent in hedges and thickets, but scarcely wild.

A. Pseudoplatanus, L. Greater Maple or Sycamore. S. May—June. Thickets—not wild.

ORDER—GERANIACEÆ.

ERODIUM. *L'Herit.* Stork's Bill.

E. cicutarium, Sm. Hemlock Stork's Bill. A. June—August. Frequent in dry pastures, corn fields, and by roadsides.

GERANIUM. *Linn.* Crane's Bill.

G. pratense, L. Blue Meadow Crane's Bill. P. June—September. Oulton Pontefract, Ledstone, (Mr. Roberts.)

G. pusillum, L. Small-flowered Crane's Bill. A. June—September. Oakenshaw, Heath, Woolley, &c.

G. molle, L. Dove's Foot Crane's Bill. A. April—August. Common.

G. dissectum, L. Jagged-leaved Crane's Bill. A. May—August. Frequent.

G. columbinum, L. Long-stalked Crane's Bill. A. June—August. Went Valley.

G. lucidum, L. Shining Crane's Bill. A. May—August. Went Bridge Purston.

G. robertianum, L. Stinking Crane's Bill, Herb Robert. A. May—October. Common.

ORDER—OXALIDACEÆ.

OXALIS. *Linn.* Wood Sorrel.

O. Acetosella, L. Wood Sorrel, A. May. Frequent in woods. Supposed

by some botanical authors to be the *True Shamrock*, although the name has been long applied to the much less beautiful *Trifolium repens*, or Dutch Clover," Hooker.

O. corniculata, L. Yellow Procumbent Wood Sorrel. A. June—September. Occasionally found in gardens.

Sub-Class II. Calycifloræ.

A. Corolla Polypetalous.

Order—CELASTRACEÆ.

Euonymus. *Linn.* Spindle Tree.

E. europæus, L. Common Spindle Tree. S. May—July. Pontefract, Lofthouse. In some parts known as Witch Wood, and described by Tennyson, as —

"The fruit
Which in our winter woodlands looks a flower."

Order RHAMNACEÆ.

Rhamnus. *Linn.* Buckthorn.

R. catharticus, L. Common Buckthorn. S. May—July. Kippax, Garforth, Langley Wood, Castleford, (Mr. Roberts).

R. Frangula, L. Alder Buckthorn. S. May—July. I have a note of having found this plant in Langley Wood, but I have no specimen from the locality.

Order—LEGUMINIFERÆ.

Spartium. *Linn.* Broom.

L. scoparium, L. Common Broom. S. April—June. Heath, Notton, Royston Railway Embankments, &c.

Ulex. *Linn.* Furze, Whin, Gorse.

U. europæus, L Common Furze. S. In flower more or less throughout the year. Common.

Genista. *Linn.* Green-weed.

G. tinctoria, L. Dyer's Green Weed. S. July—September. Sharleston, Hell Lane, Roystone, &c.

G. anglica. L. Needle Green Weed, or Petty Whin. S. May—July. Ryhill, Woolley Edge.

Ononis. *Linn.* Rest Harrow.

O. arvensis, L. Common Rest Harrow. P. June—August. Frequent.

O. antiquorum, L. Upright Rest Harrow. P. June—August. Frequent.

Mr. Watson *(Cybele Britannica)* makes these plants distinct species, but Bentham, and Hooker and Arnott consider the latter a variety of *O. arvensis*; and Mr. Syme in the new edition of English Botany, thinks there are good grounds for accepting it as a distinct species. The two plants grow much together in many parts of England.

ANTHYLLIS. *Linn.* Kidney Vetch.

A. vulneraria, L. Common Kidney Vetch. P. June—August. Foulby, Smeaton, Went Bridge.

MEDICAGO. *Linn.* Medick.

M. lupulina, L. Black Medick, or Non-such. A. April—August. Common. The fibres of the roots of this plant are often covered with small oval knobs.

M. sativa, L. Purple Medick or Lucerne. P. June—August. Near Lascelles Hall, Mr. Hobkirk.

M. maculata, Sibth. Spotted Medick. A. May—August. Whitley Willows, Mr. Hobkirk.

M. denticulata, Willd. Reticulated Medick. A. April—August. Whitley Willows, in 1858 Mr. Hobkirk; on a manure heap in Balne Lane, near Wakefield in 1856, Miss Gissing. The above three species are very doubtfully wild in the localities given; the latter near Wakefield has never appeared since.

MELILOTUS. *Tourn.* Melilot.

M. officinalis, Willd. Common Melilot. A. or B. May—July. Frequent on Railway embankments in the neighbourhood.

M. arvensis, Wallr. Field Melilot. B. July—September. On a rubbish heap, Balne Lane, near Wakefield, 1856. Miss Gissing.

TRIFOLIUM. *Linn.* Trefoil Clover.

T. repens, L. White Trefoil or Dutch Clover. P. May—August. Common. By *some* believed to be the true Shamrock. Still one hopes St. Patrick had good taste enough to select the much more beautiful *Oxalis acetosella*.

T. pratense, L. Common Clover. P. May—September. Common.

T. medium, L. Zigzag Trefoil. P. June—September. Bedlam Steps, Allerton, (Miall and Carrington) Ossett.

T. arvense, L. Hare's Foot Trefoil. A. July—September. Knottingley.

T. resupinatum, L. Reversed Trefoil. A. July. On a rubbish heap in Balne Lane, near Wakefield, 1856; Miss Gissing. Not wild.

T. procumbens, L. Hop Trefoil. A. May—October. Common.

T. minus, Relh. Lesser Yellow Trefoil. A. June—August. Common. Fibres of the root often covered with small oval knobs.

T. filiforme, L. Slender Yellow Trefoil. A. June—August. Plentiful at Heath and other places. Hooker and Arnott consider this plant a variety of *T. minus*. Mr. Bentham has seen specimens of the true plant from Gravesend, Kent.

LOTUS. *Linn.* Bird's Foot Trefoil.

L. corniculatus, L. Common Bird's Foot Trefoil. P. June—September. Common.

L. major, Scop. Narrow-leaved Bird's Foot Trefoil. P. June—September. Frequent. Generally considered a variety of *L. corniculatus*.

ASTRAGALUS. *Linn.* Milk Vetch.

A. hypoglottis, L. Purple Mountain Milk Vetch. P. June—August. Wenthill; and near the encampment, Went Valley.

ORNITHOPUS. *Linn.* Bird's Foot.

O. perpusillus, L. Common Bird's Foot. A. May—July. Common at Heath, Oakenshaw, &c., where I have gathered it *two* feet long.

VICIA. *Linn.* Vetch, Tare.

V. cracca, L. Tufted Vetch. P. June—August. Common.

V. sativa, L. Common Vetch. A. or B. May—August. Common.

ON SOME SPECIES OF *THLASPI*.

BY JOHN WINDSOR.

In the "*Naturalist*" for June 1st, I offered a few remarks on *Thlaspi alpestre* as it occurs in Teesdale, near Settle, and at Matlock. In that paper I probably spoke sufficiently respecting the form and development of the pouch and style, which I find to be about the same in each locality; nor is there any particular distinction in other parts of the plant.

On the 2nd of this month (June) I visited Matlock and found the *Thlaspi*, accompanied, as it often is, by *Arenaria verna*, in considerable plenty.

Several of the specimens were quite equal in height to the two or three I have had an opportunity of seeing from Teesdale, thus confirming the idea I expressed before, that the stature of the plants chiefly, although not entirely, depended on age or approach to maturity.

There is one other character of the plant which is I believe common to all its localities, I mean the glaucous aspect of the foliage. This was very decided in all the numerous specimens I saw a few days since growing at Matlock, so that as applied to them, the name (were it derived from the hue) of *glaucum* or *glaucescens* would be much more appropriate than that of *virens*.

On the whole from a consideration of the subject and a fair comparison of the plant from its different localities, I am of opinion that it may be justly referred to one species—*Thlaspi alpestre*.

P.S.—Since writing the above, I have had an opportunity of comparing recent specimens, collected three days previously near Malham four miles from Settle, of *Thlaspi alpestre* which has been called *occitanicum* with the *Thlaspi alpestre* of Matlock, which has been called *virens*, collected one day earlier than the other.

The Settle form agrees upon the whole pretty well with the description of it in *Babington's Manual*, the silicles being generally triangular-obcordate—the notch from the diverging lobes very distinct, and the style elongated.

On the other hand the silicles in the Matlock plants (and I consider the Teesdale one the same species) have a mixture of triangular-obcordate pouches with some more, of an oblong form, so that there is little distinction in the head, although the triangular-obcordate form perhaps slightly predominates in the Settle form. The length of the projecting style is much the same in all, and I believe I am correct in stating that the same remarks apply to the *Thlaspi alpestre* from near Namur.

Manchester, June 7th, 1865.

MY MARINE AQUARIUM.

Perhaps a few notes on the subject of marine aquaria may not be uninteresting to some readers of the "*Naturalist*", and may lead some of them, during the coming summer to undertake the care of this interesting ornament to a room. With this idea I beg to offer them a few jottings from my own experience, which however, I may say has not been of very long duration. In fitting up mine I made use of a vase which had previously been used for a fresh water aquarium, and in which the rock-work, made of small stones cemented together with Roman cement, did not require any previous preparation. Of course in building up rocks with this cement care

should be taken to keep the vase well filled with fresh water for some days, (to be changed frequently) until all the deposit dissolved out of the cement has quite disappeared ; and no animal or vegetable life should be placed in it until this is completed, otherwise they will quickly die off. Mine being thus previously prepared I filled it with artificial sea-water made as follows :

To one gallon of pure spring water add :—

Common salt, $3\frac{1}{2}$ ozs.

Epsom salts, $\frac{1}{4}$ oz.

Chloride of Magnesium, 200 grains.

Chloride of Potassium, 40 grains.

After these salts have been well stirred about in the water it must be strained through a piece of muslin.

The sea-weeds to be put in the aquarium should be such as are attached to bits of stone ; the best for thriving being the most sombre coloured ones, —avoid all the red ones—take the dark-brown and green ones—the former of which I have found to be best.

In my aquarium which was fitted up last September, and has never had the water changed since, I placed some three or four pieces of rock having weed attached at the bottom ; which, may be advantageously covered over with clean small pebbles. As I have not studied Algology much I cannot with certainty name the species I put in,—I think they were *Dictyota dichotoma*, *Desmarestia aculeata*, and one or two others which I was unable to name. This however is not of much importance in my case, as there is but little of any of them left. The animals put in were of no great rarity, but such as may be picked up in almost any tide pool. There were three or four Actiniæ, *A. mesembryanthemum;* two limpets, *Patella vulgaris;* five or six whelks, *Purpura lapillus ;* and one *Chiton.*

Of the sea-weeds all except one *Desmarestia* gradually withered away and had to be taken out, so that by the end of December, there was none of the original stock left, except the one above mentioned ; but this continued in good health and seems to be an excellent oxygen producer. In a paper I recently read by Mr. Shirley Hibberd, respecting his fresh water aquarium, he says, that he never put any plants into it, but left it to nature who soon supplied in the shape of *Confervæ*, &c., what she required. My own experience as far as it goes, is quite in accordance with this, as although, I placed some sea-weeds in the vase they soon withered away, but now there is a growth of new forms which seem quite sufficient to maintain the balance : every stone bristles with this minute vegetation, and every branch of it

during the day time bears a small bubble of oxygen. My only fear is they will soon become too many for me. With regard to the *Actiniæ*, during the dark winter months they seemed very unhealthy and dwindled down to not more than half their original size and bulk, but the warm weather and sunshine of early spring seemed to re-invigorate them and they are now as large as ever. This creature is a most beautiful object, as, fixed to the rocks it expands its finger-like tentacula, alternating with the little sky-blue knobs, that surround them ; frequently when one of the larger ones has been near the surface, and fully expanded, I have placed the tip of my finger amongst the tentacles, round which they almost immediately closed, my finger at the same time experiencing a slight shock, similar to galvanism. During the early part of March, I had an addition to my family of Anemones by the appearance of more than a score young ones dotted all over the bottom of the vase and the rock—each about the size of a small pea—some yellowish brown others crimson. Another spontaneous addition rather astonished me—a few days back whilst taking my customary peep into the vase in the morning, I was agreably surprised to find two *Chitons* sticking to the topmost stone, and both of them exactly of the same size. One only was put in—of that I am certain. I find, however, on reference Rymer Jones that some of these lower orders of Brachiapoda are hermaphrodite and self-generating, which of course accounts for the appearance of my second *Chiton*. On taking out a few drops of the water from amongst a tangled piece of sea-weed and placing them in the animalcule-cage under the microscope I found innumerable *Infusoria* and a few *Rotiferæ*. In looking for these minute forms a month or two after I had fitted up the vase I could not find any trace of them. In concluding this short sketch of my experience of the marine aquarium I may repeat that the water has never been changed since it was first put in ; that it has been syringed a little recently every morning, and more frequently at first than lately, and the water constantly replenished as it evaporated, up to a fixed mark.

NOTES ON THE ORNITHOLOGY OF NORFOLK.

By T. E. Gunn.

VARIETIES.

Skylark. A pale buff variety, a female was shot by Mr. J. Pearson, at Great Melton, on the 25th of March. An immature male specimen of the Rook *Corvus frugilegus*, was killed by Dr. Francis, in this neighbourhood on

the 21st of May. The entire surface of its plumage is of a uniform slate colour somewhat inclining to a brownish tint, the feathers of its upper wing coverts are narrowly margined with a darker shade.

RARITIES.

Peregrine Falcon. A nice male was obtained on the 2nd of March, at Reedham, its entire length from beak to tail was seventeen inches ; and from tip to tip of its extended wings thirty-eight inches ; wing from carpal joint to tip twelve and a half inches.

Marsh Harrier. An adult pair of these birds was killed by a marshman at Hickling, in April last ; the male on the 13th, and the female on the 20th. About a fortnight afterwards a second pair of old birds of the same species made their appearance in the same locality, and in all probability with the intention of supplying the place of their predecessors ; however, as soon as their presence was noticed they shared the fate of the former occupants. The female individual of the first mentioned pair, measured twenty-one and a half inches from beak to tail ; and fifteen and a half inches in the wing from the carpal joint to tip. Their food appeared to consist principally of leverets, small birds, &c., an entire leg of the former I found in the stomach of one of the males. I also noticed the gizzard of some small insectivorous bird in one of them, they appeared to have subsisted well since their arrival, as their bodies were quite loaded with fat. A fifth individual of this species, a female, was killed on Ranworth Broad, yesterday.

Hoopoe. April 22nd, a splendid mature female was shot in Mr. Read's garden at Great Plumstead, near Norwich. It was preserved by Mr. Pear.

Snow Bunting. An old male of this species, died a few days since out of the aviary of Mr. Taylor, a gentleman residing in this city. It was an exceedingly fine example ; its weight being full two ounces. Length from beak to tail (both inclusive) seven inches ; the colour of the beak of *Emberiza nivalis*, in winter is of a pale yellow, which in summer changes to that of a beautiful deep bluish black. The above example was very fat, and appeared in a remarkably good state of plumage for a confined bird, indeed when I first observed it I thought it a fresh captured specimen.

Roller. A most magnificent specimen, a mature male of this very rare species to the British Isles, occurred off the coast of Yarmouth, about the 24th inst. It was apparently directing its course to that locality, but being fatigued by its journey it alighted on the rigging of a ship a short distance out at sea in the Yarmouth Roads ; one of the sailors captured it while in

this exhausted condition and brought it with him ashore, and soon parted with it to another party who kept it alive a day or two ; but refusing food it soon died, when it was sent up quite fresh to Norwich, and purchased by Mr. J. Sayer, who still has it in his possession. In passing through my hands for preservation, I had excellent opportunities of making a few personal observations on this rare visitor; and it affords me much pleasure in placing them before the readers of the "*Naturalist*," thinking at the same time that my remarks although brief may not be uninteresting.—It measured twelve and a half inches from tip of beak to tip of tail; twenty-five inches across the extended wings to the extreme tip of each; and seven and three quarters inches from carpal joint to tip; the second and third primary quill feathers are the longest; tail five inches; bill, tip to gap, one and three quarters inches; the upper mandible is slightly hooked at the tip, and of a blackish brown, assuming a paler hue towards the base. The inside of its mouth is of a pale greenish yellow ; iris dark brown ; legs and toes dull lemon yellow ; claws blackish brown. I opened its stomach which emitted rather an unpleasant odour of coleoptera, it was however empty, excepting a small portion of the leg of a beetle, apparently that of the dung beetle *Getrupes stercorarius.*

Green Sandpiper. April 17th, a female at Barford. Mr. Canham.

Oystercatcher. April 5th, one, a female. Blakeney.

Bittern. March 6th, one example, Wroxham Broad.

Whimbrel. May 5th, a male.

Swans. March 15th, a nice example of *Cygnus minor*, being the third instance of its occurrence this season. March 25th, an immature specimen of *Cygnus musicus.*

Ducks, &c. March 8th ; Red breasted *Merganser*; a female, Ranworth Broad. March 15th : two Golden Eyes, a male, a few Pochards, tufted, and a common Scoter. April 20th : Four common Scoters ; three males, and one female, from Hickling. April 26th. Two Shielducks, Rockland.

Red Throated Diver. March 18th, a female, Wroxham Broad.

Comorant. March 21st, a female, Hoveton.

Red Necked Grebe. March 25th, one male. This is the latest example I have noticed this season.

Terns. A splendid old male of the Black Tern, *Sterna nigra*, was killed on our coast, on the 18th of April. In dissecting it, as I usually do with various birds that pass through my hands, I found its gizzard fully extended with various aquatic insects, some of which it had evidently

taken while on the wing, as I observed the wing cases of the small coleoptera shut up close while the wings of the insects protruded behind. The Lesser Tern, *Sterna minuta*, made its appearance about the 16th of April, in the usual haunts on our coast, around Wells, Hunstanton, &c.

Norwich, May 30th, 1865.

Review.

Le Microscope, et son application aux études d'Anatomie Végétale, par Prof. Henri van Heurck.—34 Figures. (Paris, Adrien Delahaye, 1865.)

The author of this little book states in his preface, that his reasons for publishing it, are, that there is no work in the French language solely devoted to vegetable microscopy; and that having been frequently consulted by friends as to his method of preparing certain organs, he was led to give the result of his researches in this form. The work is intended principally for the use and guidance of young microscopists who desire to study vegetable anatomy, and we hope it will lead many young botanists who have been hitherto content with simply gathering and naming plants, to study their more intimate construction with the aid of the microscope. The first part of seventy pages is devoted to a description of the construction of the microscope, and the remaining thirty-four pages to the special methods of examining and mounting the various tissues, &c. We should have been glad if the latter portion had been somewhat more extended, even to the curtailment of the former. We cannot acquiesce in the author's opinion of the comparative value of instruments of English and foreign manufacture; * for although the price of English microscopes is higher than that of Continental ones, the former are certainly of much greater value and utility—at the same time as M. Ehrenberg once stated at a meeting of the British Association, a comparatively inferior instrument with "good eye" behind it, may be productive of higher results, than the best instrument *minus* the eye. Amongst foreign makers the Professor considers Messrs. Hartnack, Chevalier, and Natchet, the best.

The second portion of the work before us, as before stated, treats of the method of examining and mounting various vegetable structures, and is divided into eleven chapters. Each chapter treats on some particular branch of the vegetable economy, such as, cells, cell-membranes, cell-contents, hairs, seeds, spores, &c., &c.: under each head is given a number of plants in which the particular object treated on is best found, how to prepare, examine and mount it, and the magnifying power best adapted for the complete preparation. We have no doubt the work will be of value to many a young botanical microscopist and lead him gradually on to such an advanced stage of the study, as to fit him to peruse with advantage more critical and expensive works.

* "D'excellents microscopes sont fabriqués en Angleterre par Ross, Smith and Beck, Powell and Lealand de London, and Dancer de Manchester; mais ces instruments sont d'un prix exorbitant et d'un complication excessive.....La facilité des relations et la proximité font qué dans notre pays l'on s'addressera le plus souvent á Paris, ou, á un prix relativement bien moindre, l'on se procurera des instruments aussi parfaits que ceux que l'on pourra se procurer en Angleterre." Le microscope, &c. p. p. 39-40.

Deux Ascensions Scientifiques au Mont Blanc, leurs résultats immédiats pour la Météorologie, la physique du globe et les sciences naturélles, par. CHAS. MARTINS, Prof. d'histoire naturelle á Montpellier, &c. (Paris, J. Claye, 1865.)

Anything from the pen of Prof. Chas. Martins is sure to recommend itself to the enquiring naturalist, and the little *brochure* under consideration is no exception to the rule. With the purely physical portion of the article, it would be out of our province to meddle—indeed it is not so much a critique as a simple notice, that we purpose to lay before our readers. Prof. Martins first gives us a clear and succinct account of the great scientific ascent of Mont Blanc, by H. B. de Saussure, in 1787, and its results, on the scientific world generally, and then compares these results with an ascent made by himself in company with Auguste Bravais and Auguste Lepileur, commencing on the 31st July 1843, marshalled by the three well-known guides M. Couttet, J. Mugnier, and Theod. Balmat, and thirty-five porters to carry the various scientific apparatus to be used. Besides a variety of physical observations made during the journey, some confirming, others correcting those of De Saussure and others, he gives us a list of the plants which have been found at the various times growing at the Grands Mulets. These number eighty-two species, of which, twenty-four are phanerogams ; twenty-six mosses ; two hepaticæ ; and thirty lichens. A list is furnished of the Phanerogams, as under, viz :—

Draba fladnizensis. Wulf.
D. frigida. Gaud.
Cardamine bellidifolia. L.
C. resedifolia. Saut.
Silene acaulis. L.
Potentilla frigida. Vill.
Phyteuma hemisphericum. L.
Pyrethrum alpinum. Willd.
Erigeron uniflorus. L.
Saxifraga bryoides. L.
S. grœnlandica. L.
S. muscoides. Auct.
S. oppositifolia. L.
Androsace helvetica. Gaud.
A. pubescens. D.C.
Gentiana verna. L.
Luzula spicata. D.C.
Festuca Halleri. Vill.
Poa laxa. Haencke.
P. cæsia. Sm.
P. alpina var. *vivipara.* L.
Trisetum subspicatum. P. Beauv.
Agrostis rupestris. All.
Carex nigra. All.

In a few weeks these plants accomplish all the phases of their vegetation—and yet they serve for the nourishment of one of the Rodents, *Arvicola nivalis*, Mart. the only mammal which is to be found at so great an elevation on the Alps.

We should have been glad to enter more into the details given by M. Martins, but as our space is limited we must forbear.

Reports of Societies.

BOTANICAL SOCIETY OF EDINBURGH.

XXIX SESSION—VI. MEETING.

The society met on Thursday, 13th April, at 5, St. Andrew Square.—Dr. Alexander Dickson, president in the chair. The following donations to the University Herbarium were announced :—From Professor Clos, Toulouse, plants from the south of France ; from Henry Trimen, Esq., rare plants from the New Forest, Hampshire ; from F. Naylor, Esq., specimen of *Hypericum undulatum*, from near Plymouth ; from T. B. Flower, Esq., Bath, specimens of *Ononis reclinata*, collected in Jersey ; from Mr. Roy, Aberdeen, specimens of *Polytrichum sexangulare* ; from Dr. Lauder Lindsay, specimens of *Grimmia ptychophylla* and *Sphœria Lindsayana*, from New Zealand. The following communications were read : —I. An account of the Flora of that part of Hampshire called the New Forest. By Henry Trimen, Esq. The author commenced by describing the situation, boun-

daries, extent, geology, scenery, and physical geography, of the New Forest, and then proceeded to an examination of its botany. After noticing briefly the plants recorded by various authors, and remarking on the little attention which the district had received from botanists, he stated that the number of species known to inhabit it now amounted to 723, of which number he had himself collected 530. Having divided the flora of the Forest into three groups—the plants of the heaths and moors, those of the woods, and those of the streams and water courses—Mr. Trimen enumerated the more important species in each division, and showed specimens of many of the plants he mentioned. Amongst these were specimens of *Gladiolus illyricus* (Koch), a very handsome plant, only discovered as a native of this country in the New Forest a few years ago. The author then gave a sketch of the flora of the sea-coast, and of the cultivated parts of the district, and remarked on the few species found in those localities. The flora was then considered as a whole, and shown to contain many species of both the east and west of England, which are not usually found in the same district. The western type of vegetation was seen to prevail however, and this was considered to be due to the damp humid climate. Numerous species, rare in the south of England, but common in North Britain, were mentioned, and their growth traced to the barren nature of the soil. After alluding to the influence of the geological formation of the Forest on its flora, the author concluded his paper by urging collecting botanists to compile complete and accurate lists of the plants of a district, in preference to hunting for varieties. The paper was illustrated by a map of the Forest, and by numerous dried specimens of plants.

II. Contributions to the Flora of Otago (New Zealand). By Dr. Lauder Lindsay.—No. 2, Rare Cryptogams.—In this paper the author gave an account of some rare plants belonging to the natural orders Musci, Hepaticæ, and Algæ, which had been collected by him in New Zealand. Most of them had not been previously gathered in that country.

III. Under the Snow, or the Flowering of Plants in Closed Cases. By N. B. Ward, Esq.

IV. Report on the Flowering of Plants in the open Air at the Royal Botanic Garden. By Mr. M'Nab. Mr. M'Nab enumerated 39 species of plants which had come into flower in the open air from 10th March till 12th April.

Mr. Sadler exhibited specimens of *Dicranodontium asperulum* of "Mitten's Musci Indici," collected at Mains Castle, New Kilpatrick, by Mr. W. Galt.

Dr. John Anderson, Calcutta, sent photographs exhibiting the condition of many of the trees in the Botanic garden there after the late cyclone.

VII. MEETING.

The society met on Thursday. 11th May, in the new Histological Class-Room, at the Royal Botanic Garden—Dr. Dickson, president in the chair. The following additions to the University Herbarium were noticed:—220 species of European mosses, named by Dr. Schimper; specimens of *Orthodontium gracile* and *Grimmia trichophylla*, collected by Mr. Robinson, Frodsham. The following donations to the Museum were announced:—From Charles Lawson, Esq. Cusco maize, from Peru; from Dr. Alexander Dickson, birch and willow wood affected by *Peziza æruginosa*, and assuming a green colour. The following communications were read:—

I. On the Morphological Constitution of the androecium of *Mentzelia*, and its analogy with that of certain Rosaceæ, by Dr. Alexander Dickson. The author gave the results of his investigations of the development of the stamens in *Mentzelia aurea*. From the fact of the greater number of the stamens not appearing until after the development of the carpels, as well as from a consideration of the peculiar arrangement of the stamens, he believed that here the androe-

cium really consists of five compound and confluent stamens superposed to the sepals. Dr. Dickson is of opinion that the only essential difference between *Mentzelia* and its allies, on the one hand, and *Loasa* and its allies on the other, is, that in the former the evolution of staminal lobes is centripetal, in the latter centrifugal : both series of genera agreeing in having five compound stamens superposed to the sepals. This difference in staminal evolution does not appear to Dr. Dickson sufficient to justify the breaking up of the old order Loasaceæ, as has been done by Payer in his "Lecons sur les Fam. Nat. des Plantes." In the Rosaceæ, where Payer had recognised a similarity in staminal evolutions to the Mentzeliæ, Dr. Dickson believes that those androecia the development of which has been examined may be arranged under two types: —1. Aremonia type ; stamens superposed to the sepals, with or without a true corolla. Examples—*Aremonia*, *Agrimonia*, *Sanguisorba*, *Poterium*. In *Aremonia*, and *Sanguisorba* the stamens are simple ; in *Agrimonia* they are compound and distinct; and in *Poterium*, compound and confluent. 2. *Alchemilla* type ; stamens alternate with the sepals ; no true corolla. Examples :—*Alchemilla*, *Rubus*, *Rosa*, *Geum*, *Fragaria*, &c. In *Alchemilla* the stamens are simple. In *Rubus* and the others the stamens are compound and confluent, with their terminal lobes developed as petaloid staminodes (the petals ordinarily so-called) analogous to the petaloid staminodes forming the inner corolla of *Bartonia* an ally of *Mentzelia*.

II. Report on the Cinchona Plantation at Darjeeling in February 1865, by Dr. Thomas Anderson.

III. Abstract of a Report on the Pitayo Cinchonas by Mr. Robert Cross.

D. D. Moore, Glasnevin, sent living plants of *Neotinea intacta* from Galway. He stated that he had seen about forty plants in the station, but only one of them was in flower. They grew on a dry bank close to limestone gravel. Mr. Sadler stated that Dr. F. B. White had recently gathered the following rare mosses near Perth :—*Grimmia orbicularis*, rocks on Kinnoul Hill ; *G. Schultzii*, Dunsinane Hill ; *G. leucophœa*, Callerfountain Hill ; *G. trichophylla* do. ; *Hypnum abietinum*, do. ; *H. rugosum*, do. Dr. Dickson exhibited growing plants of *Pinguicula vulgaris*, from various Scotch localities. The plants showed some marked differences in their flowers and leaves, and seemed to indicate at all events distinct varieties. Mr. M'Nab placed on the table growing plants of hybrids produced between *Primula vulgaris* and *P. veris*, and between *P. vulgaris* and *P. elatior* ; also a plant of *Athyrium Filix-fœmina* var. *Victoria*, from Buchanan House. Mr. Gorrie exhibited specimens of a large blue-flowered *Anemone*, found naturalised at Cullen House : also a plant of *Myosotidium nobile* from Chatham Island. The following gentlemen were elected members of the society :—1. As a Resident Fellow—Ramsay H. Traquair, M.D., 30, Clarence Street. 2. As a Foreign Member—M. Dominique Clos, M.D., Professor of the Faculty of Science, and Director of the Botanic Garden, Toulouse.

Richmond and North Riding Naturalists' Field Club.—Monthly meeting, Tuesday June 13th, 1865. The president E. Wood, Esq., F.G.S., in the chair. There was a large attendance of members together with a number of ladies. Two new members were elected. The president exhibited specimens of the organs of hearing in the different species of fish, called ear-bones ; also a quantity of fossils and some specimens of landscape marble and of iron pyrites impregnated with gold. The secretary exhibited specimens of the Golden Eye, *Anas clangula*, and Scoter *Anas nigra*, recently shot at the Tees-mouth,—also, a box of Lepidopterous insects, collected during the present month. The president stated that he hoped by the next monthly meeting to be able to lay before them some fossil human remains, from the Shetland Isles ; where he and several other geological friends intended exploring, by the kind

permission of the Earl of Zetland, and to which excursion the noble lord had handsomely contributed. After a vote of thanks to the president, the meeting adjourned to the second Tuesday in July.

Observations.

List of Plants found in Merionethshire, North Wales, September, 1864.

The following is a list of the chief plants I met with during a month's stay at Llandderfel, North Wales ; my botanizing was chiefly in the county of Merionethshire, but once or twice I was in other counties :—

Trollius europæus ; river below Pont-y-Glyn.

Berberis vulgaris ; between Bethel and Llangwn.

Corydalis claviculata ; about Llandderfel.

Nymphæa alba ; Llyn Cryni near Bethel.

Nuphar lutea ; Llyn Mynnodd Llœd near Llanderfel.

Cakile maritima ; common by the sea shore, Rhyl, Flintshire.

Lepidum Smithii ; on a wall near Pont-y-Glyn.

Subulara aquatica ; Llyn Cryni near Bethel.

Cardamine hirsuta ; by the Clettwr river, near Llanderfel.

Sinapis nigra ; about Llanderfel.

Viola palustris ; common in bogs about Llanderfel.

V. arvensis : cornfield beyond Cefn-ddwysarn

V. lutea : on the mountains beyond Cefn-ddwysarn.

Drosera rotundifolia ; in several bogs near Llanaderfel.

Lychnis diurna var *alba ;* near Llandderfel.

L. vespertina ; Mœl Calch near Llandderfel.

Honckeneja peploides : sea shore, Rhyl, Flintshire.

Stellaria graminea ; near Cefn-ddwysarn.

Radiola millegrana ; near Llandderfel.

Malva moschata ; about Llandderfel ; very common.

This is the common Mallow, about Llandderfel, we did not see any other all the time we were in North Wales.

Hypericum dubium ; near Llandderfel.

H. humifusum near Llandderfel.

H. elodes ; bogs near Llandderfel.

H. pulchrum ; Berwyns near Llanderfel.

Erodium cicutarium : white variety, in abundance by the sea shore, Rhyl, Flintshire.

Geranium lucidum ; near Llandderfel.

Oxalis acetosella ; this plant is I think the commonest plant in damp ditches and woods about Llanderfel.

Ulex nanus ; common on the Berwyns near Llandderfel.

Ononis antiquorum ; sea-shore Rhyl, Flintshire.

Lotus major ; near Llanderfel.

Vicia orobus ; near Cefn-ddwysarn.

Prunus padus ; near Llandderfel.

P. spinosa ; near Llandderfel.

Spiræa ulmaria ; near Llandderfel.

S. salicifolia ; hedges of this plant were were seen about Llandderfel apparently wild.

Geum rivale ; near Pont-y-Glyn.

Comarum palustre ; bogs near Llandderfel.

Rubus saxatilis ; near Llandderfel, by the Clettwr river.

R. cæsius ; near Llandderfel.

Poterium Sanguisorba ; between Bethel and Llangwm.

Pyrus malus ; near Llandderfel.

Epilobium montanum ; near Llanderfel.

Peplis portula ; bogs near Llandderfel.

Sedum reflexum : Pont Llandderfel.

S. Telephium ; near Llandderfel.

S. acre ; about Llandderfel, rare.

S. anglicum ; this the common Sedum about Llandderfel.

Cotyledon Umbilicus ; in the crevices of stone walls about this part of Merionethshire, common, especially about Llandderfel.

Saxifraga stellaris ; on the rocks by the side of the Clettwr river, and on the rocks at Pont-y-Beddws.

Chrysosplenium oppositifolum ; near Llandderfel.

Hydrocotyle vulgaris ; bogs on the Berwyns near Llandderfel.

Eryngium maritimum : sea shore, Rhyl, Flintshire, common.

Pimpinella Saxifraga ; near Llandderfel.
Torilis infesta ; near Llangynnog.
Lonicera Periclymenum ; nearLlandderfel.
Asperula odorata ; between Llandderfel and Bala.
Valeriana dioica ; meadows between Capel Bethel and Llandderfel.
V. officinalis ; Pont Llandderfel.
Scabiosa columbaria ; near Llandderfel.
Lactuca muralis ; lane near Llandderfel.
Carduus heterophyllus ; beyond Cefn-ddwysarn.
Tanacetum vulgare : about Llandderfel.
Artemisia Absinthium ; near Pont-y-Glyn.
Gnaphalium uliginosum ; near Llandderfel.
Solidago Virgaurea ; about Llandderfel.
Doronicum plantaginium ; near Llandderfel.
Pyrethrum parthenium ; near Llandderfel.
Achillea Ptarmica ; beyondCefn-ddwysarn.
Campanula rotundifolia, var *alba ;* near Llandderfel.
Wahlenbergia hederacea ; Gwirnall on the Berwyns, about three miles from Llandderfel, and in a bog at the south end of Earl's Wood, Llandderfel.
Jasione montana ; about Llandderfel.
Lobelia Dortmanna ; Llyn Cryni, near Bethel.
Vaccinium Oxycoccos ; near Llandderfel.
V. Vitis idæa ; the Grouse House on the Berwyns upwards of 2,000 feet above the level of the sea. I think this is the highest peak but one of the Berwyn mountains.
Gentiana Amarella ; Berwyns near Llandderfels.
Menyanthes trifoliata ; Mæs-y-cleowdd near Llandderfel.
Convolvulus Soldanella ; sea shore, Rhyl, Flintshire.
Verbascum Thapsus : by the sides of lanes near Llandderfel.
Bartsia Odontites ; near Pont-y-Glyn.
Euphrasia officinalis : near Llandderfel.
Pedicularis palustris ; Mæsy-Clewdd near Llandderfel.
Linaria Cymbalaria ; on the wall of Bala Bridge.
L. vulgaris ; near Llandderfel.
Verbena officinalis ; specimens of this plant were seen upwards of a yard high in a lane near Rhyl, Flintshire.
Mentha aquatica ; near Pont-y Glyn.
Origanum vulgare ; near Pont-y-Glyn.
Calamintha Clinopodium ; side of river near Pont-y-Glyn.
Teucrium scorodonia ; near Llandderfel.
Galeopsis tetrahit ; near Cefn-ddwysarn.
G. versicolor : fields beyond Cefn-ddwysarn.
Stachys betonica ; near Llandderfel.
Prunella vulgaris var alba, Llandderfel.
Prunella vulgaris ; bogs about Llanderfel.
Plantago maritima : sea shore, Rhyl, Flintshire.
Chenopodium Bonus-Henricus ; Llandderfel, common.
Polygonum bistorta ; near Llandderfel.
Empetrum nigrum ; Mountains near Llandderfel.
Listera cordata ; Mountains near Llangwm.
Narthecium ossifragum ; in bogs about Llandderfel, common.
Scirpus setaceus ; Berwyns near Llanderfel.
Polypodium vulgare ; on walls near Llandderfel.
P. Phegopteris ; near Llandderfel, and near Llangynog.
P. Dryopteris ; near Llandderfel, and near Llangynog,
Allosorus crispus ; stone walls not very far from Llandderfel, on the rocks near Llangynog, and abundant on the Mountains by the road from Llangwm to Bala, on the left hand side of the road going towards Bala, and about a mile or a mile and a quarter from Llangwm ; in this locality the plant is so common that cartloads of it might be taken without exterminating it.
Lastrea Oreopteris : near Llandderfel.
L. Filix-mas ; near Llandderfel.
L. dilatata ; near Llandderfel.
Athyrium filix-fœmina : near Llandderfel.
Asplenium Trichomanes ; Pont-y-Glyn.
A. Adiantum-nigrum ; Pont-y-Glyn.
A. ruta-muraria ; near Llandderfel.
Scolopendrium vulgare ; near Llandderfel.

Blechnum boreale ; near Llandderfel.
Littorella lacustris ; Llyn Creyny.
Lycopodium alpinum ; Berwyns between Llandderfel and Pont-y Beddws.
L. clavatum ; Berwyns between Llandderfel and Pont-y-Beddws.
L. selago ; on the Berwyns near the Grouse House and by the side of a bog at the south end of Earl's Wood near Llandderfel.—JAMES IRVINE, Chelsea.

NOTES ON BRITISH MOSSES.

No. III.

BY C. P. HOBKIRK.

Fissidens bryoides. Hedw.

This Moss is very closely allied to the one treated of in my last paper, (vol 1, p. 221) *Schistostega osmundacea.* It is rather larger, being from two lines to half an inch in height, and is much more generally distributed. It occurs in several places in this neighbourhood ; my best specimens being from near Fixby, growing on the wet banks of a small stream in one of the woods there. It is in fruit in early spring, about February and March in this neighbourhood. The genus is very aptly named from two latin words *fissus,* split, and *dens* a tooth. All the species have cæspitose or tufted stems, much resembling a frond in miniature, with leaves arranged on a flat plane on two sides of the stem, inserted alternately ; they are semi-amplexicaul, and from the base of each leaf a thin lamina affixed to the back of the midrib, runs upwards about half the length of the leaf, and partially clasps the stem. In this species a moderately thick nerve extends the whole length of the leaf, which is also bordered with a thickened margin. The areolæ or cells are rather large, irregularly hexagonal in shape, and closely filled with chlorophyll, causing the leaf to have a full green colour, and to be somewhat shining, the inflorescence in this species is monoicous, the fruit-stalk rising from near the summit of the stem, of a reddish colour and about half-an-inch in length, crowned by the erect elliptical capsule, the lid of which is conical-acuminate. The calyptra is conico-mitriform, and rather longer than the lid. The peristome is single, of sixteen equidistant teeth, of about one-third the length of the capsule. Each tooth is cleft about half way down or more into two unequal segments, geniculate or bent inwards, of a deep red colour, and transversely barred. The barren flowers are gemmiform, axillary, never terminal and rather numerous. The teeth which are very similar to those of *Dicranum,* are easily distinguished by the sudden inflexion near the middle, and in being more hygroscopic. This moss is from its minuteness very liable to be overlooked, though if noticed can scarcely be confounded with any other, except perhaps *F. viridulus* from which it is easily distinguished by its barren axillary flowers, and broader dorsal wing, According to to *Smith's Eng. Bot. v.* 40, this is the moss which engaged Mungo Park's attention so much in Africa, as to revive his drooping spirits when sinking under fatigue, as certified by original specimens in possession of his brother-in-law, Mr. Dickson.

Synonyms :—

F. bryoides. Hedw., St. Crypt. iii. t. 29. Rölding. Roth. Bridel. Funck. Bs. Sch. monog : p. 8. t. 2.

Dicranum bryoides. Sm. Eng. Bot. t. 625. Turner ; Hook : and Taylor, (in part.)

Fissidens exilis. Schwœgr. (in part.)

Exchange.

C. pudibunda and *B. hirtaria.* I have *larvæ* of these species in duplicate, which I shall be glad to exchange for *eggs, larvæ, pupæ,* or *good Imagos* of other species. Gentlemen not hearing from me in ten days to conclude that I am already supplied with what they offer.—W. MARLINE, Wool-street, Mill-street, Bank, Leeds.

Original Articles.

NOTES ON BRITISH BIRDS.

By the Rev. Geo. Jeans.

(Concluded from Vol. I., *page* 291.*)*

Corn Crake.—Nested in Tetney in 1853. Two were shot in September and brought to me, no one knowing them. Yet they breed every year in the fields around my garden at Alford. I saw two shot in one day in Cornwall, 1828, but miles apart.

Spotted Crake. Used to build every year in North Cotes Marsh, and sometimes at Tetney Blow-wells. I have shot them in Hampshire.

Baillon's Crake. I have now for some years known that I shot one of these and one of the preceding in the same place on the same day in the Aldermoor, between Alverstoke and Rowner where Gomer Fort now stands. It was in 1823 or 1824. No one to whom it was shown knew what it was, and unhappily I did not think of sending it to Dr. Latham, who was still alive at Winchester, so they were eaten, and very good they were.

Water Rail. Built in the run in my garden at Tetney.

Coots. Build in great numbers in the vast marsh of Tichfield harbour, and the proceeds sometimes cover the mouth of the Southampton river. They build in the ponds of North Coates, Lincolnshire, and they are now nesting in the lake at Peakirk.

Red Necked Phalarope. In the year 1834, while it was blowing hard, I shot three times from a boat at one swimming in the mouth of the Southampton water, but missed.

Grey Lag and Bean Goose. Are both common in the waters off Lincolnshire, whence they proceed to the Wolds in the day time to feed in ordinary weather, and to any part of the land in rough or thick weather. I have seen both species *in the town of Alford!* in a snow wreath, in a gale; and have shot at both in Tetney.

Bernicle and Brent Geese. Are also common in the waters off Cleethorpe in the early winter.

Red Breasted Goose. *Is* it "good eating"? If I remember rightly Colonel Hawker says it is uneatable.

Hooper. Are often shot at Marshchapel. One was shot at Tetney and brought to me in 1852. I dined on it two days, but could not induce others to eat more than a single mouthful.

Shieldrake. Used to build every year at Humberstone, whence I have twice had some young ones brought me.

Shoveller. Was shot on the great Blowwell, at Tetney.

Gadwall. Knox says it is shot in Sussex. I have had one sent me from the Isle of Wight.

Teal. Builds at Tetney. I have shot the young, and had the eggs brought me.

Widgeon. Common on the Blowwells, Tetney.

Scoter. I once saw the waters of Stokes Bay almost covered with this bird. I shot one which is now in the Haslar Museum.

Pochard. I have shot in numbers in Dorsetshire, Hampshire, Surrey, and Lincolnshire, as also the Scaup.

Golden Eye. Was sent to me from Yarmouth in the Isle of Wight, with the Gadwall.

Great Northern Diver and Red Throated Diver. I have seen on the Lincolnshire coast in the waters off Tetney and Humberstone.

Cormorant. Five years ago Mr. Waterton of Walton Hall took an egg at Flamborough Head, himself going down by the rope ! to get it. They are common in Portsmouth harbour, near Penzance ; when bathing with a Mr. Hockin in eighteen fathoms water in 1828, a cormorant made his appearance before us on a small rock projecting out of the water, at about one hundred and fifty yards from the shore. We had a smooth bore and some bullets and I had the first shot and struck the rock at or on his feet, possibly touching the claw ; at which he was so terrified that he leapt into the air forgetting to open his wings and we thought he was killed by a splinter. However he recovered his senses and flew away. They are common there.

Green Cormorant. Called Shag in Hampshire. I picked up a dead one in Stokes' Bay, in the autumn of 1832.

Gannet. A pair made their appearance in the bright plumage of spring at Tetney in 1852, one of which was killed. In Plymouth Sound, as I was returning to Portsmouth Harbour 1828, one kept near the vessel for an hour. In Mount's Bay, Cornwall, I have more than once seen them disperse a "school" of pilchards to the great disgust of the fishermen.

Arctic Tern. I shot when a boy at Spithead. It was sitting on the buoy of the Royal George.

Black Tern. Often comes up the Thames. I have seen it at Chertsey, and at Windsor. At the latter place, Eton rather, a shoemaker, of the name of Wrigginton, shot one in 1825, and had it stuffed.

Great Black Backed Gull. Called saddle-back in Hampshire. I once saw one following a plough with other gulls in a field near the sea at Tetney, the only one alive and in freedom I was ever within shot, of. The young I have often shot, and *eaten*. Properly dressed they are equal to hare.

Herring Gull. I have shot close to my house in Tetney.

Richardson's Skua. One was shot in May 1859, at Sutton, by Rev. C. Mason, of Bilsby who had it preserved. It was a male of the previous year, and was shot after the great storm which occurred on Whit Monday of that year.

Storm Petrel. I caught one in the run in Stokes' Bay in the autumn of 1828. The men in the preventive house tried to keep it alive but it soon died.

A CONCHOLOGICAL VISIT TO COOPER'S HILL.

By W. Nelson.

On the 17th of April, being in the neighbourhood of Gloucester, I made my way to Cooper's Hill. On arriving I found quite a chain of hills. The one I ascended is about a mile from the foot to the summit. The day was very warm, and climbing the hill very hard work, so that I had often to rest on the ascent. Beside a hedge bank I found an abundance of that curiously sculptured shell *Cyclostoma elegans*; I gathered sufficient of these in a short time and then continued the ascent of the hill. Shortly afterwards I found the lens-shaped *Helix lapicida*, also *Pupa secale*, the latter are rather awkard to collect being on the edges of small loose stones and much scattered about. I now got to the top of the hill and found myriads of dead specimens of *Helix virgata*, but not one live one could I find; which is easily accounted for, seeing that they appear later in the year than most of their congeners. There are some fine views of the surrounding country to be obtained from the top of this hill; but being intent on collecting I at once passed into a large wood, composed chiefly of beech trees, and in searching among the dead leaves I found *Clausilia laminata* but only very sparingly; it requires much diligence in searching for them; the silence in the wood was intense, and it

was only broken by the screaming of the jay as it flew overhead, and the repeated notes of a distant cuckoo.

Shells were so scarce that I soon got tired of searching for them ; and was proceeding in rather a dissatisfied manner, when I found a fine large specimen of *Helix pomatia*, which piece of success roused me from my lethargy. The clouds had been gathering for some time, and now the rain began to come down in torrents, accompanied by thunder ; not relishing my position among the trees during the thunderstorm I proceeded to the open part of the hill again, and there awaited the end of the storm with becoming resignation. When it was over I partly descended the hill to some cottages to enquire my way to Birdlip, and in answer to my enquiries a woman pointed it out to me ; but it was so far off, and being so fatigued I declined going, and stopped and tried another part of the wood. The rain again commenced, and at this time seemingly to continue. After searching sometime without much success, I at last found *Helix lapicida* in great quantities also *Clausilia laminata*, several of which are the beautiful variety *pellucida*, I also found *Bulimus montanus*, I collected till I was weary, the abundance of the shells being something astonishing, some trees having as many as twenty specimens on them, chiefly *Helix lapicida*, and *Clausilia laminata*, with occasional specimens of *Bulimus obscurus* and *Clausilia rugosa*. There were also great quantities of Slugs, chiefly *Limax arborum ;* turning to retrace my steps I found two more specimens of *Helix pomatia* ; when crawling they are truly magnificent mollusks with their whitish diaper-like mantles.

The continued wet precluded all search for the smaller species. Having collected more than I want of *Helix lapicida*, *Clausilia laminata*, and *Cyclostoma elegans*, I shall be happy to supply such as may think them worth sending for.

39, *Darwin-Street, Birmingham.*
May 22nd, 1865.

TWO HOURS ON PUFFIN ISLAND, NORTH WALES, ALGÆ HUNTING.

By C. S. Gregson.

Thursday June 22nd, 1865, will long be remembered as a red-letter day by the members and friends of the Liverpool Field Naturalists' Club, who on that morning at nine a.m., to the number of about four hundred met on

the great landing stage to go on board the fine steamer the "*Eblana*" which had been chartered to convey the party to Llandudno and Puffin Island, for a day with nature and art. It is not my purpose to say how nobody was sea-sick or how everybody enjoyed themselves, how lake-like the sea was, or how magnificent the scenery, how hungry the whole party were, at eleven a.m. when launch was served, or rather when everybody who could get at it helped themselves as long as it lasted. I only know one little member refused to part with a nor-west quarter of a large Melton Mowbray pie for a famishing lady, when he had secured the power of boxing the compass round it, and I almost wished the great ship would just give one of her best *lurches; just one*, in half-an-hour that the *fishes* might have got the whole pie at second-hand; and, I need not tell how anxious everybody to the number of three hundred and fifty were to go ashore at Llandudno, or how jolly the fifty or so were, who intent upon exploring Puffin Island remained on board to proceed there; some gun in hand, with hearts and hopes big enough to expect at least a *great-auk* in this little known and fearfully exposed island; others preparing dredging apparatus, with a will as though it was the first day of the oyster season; whilst satchels for plants, and geological hammers and chisels were to be seen peeping out of pockets, where little expected; and lastly, the Algologists were seen busy cutting newspapers into nice square pieces to be ready for work the moment the ships-boat landed them on the island; it is with these I have to do just now, and to give the results of about two hours work by Mr. Marratt and myself.

I was very properly barred out for competing for the prizes offered by the Club for the greatest number of species collected during the day because I had taken higher prizes, and this was an advantage to me, as it gave me an opportunity of looking for plants, obscure, little known, or difficult to get at, whilst I knew my friend would do his best to obtain numbers of species, and by this division of labour the following results have been obtained,

Puffin Island is composed of carboniferous lime stone and the shelving side on which we landed is being rapidly abraded to high tide mark forming little rock-pools in thousands, six to ten inches in diameter and from four to six inches deep; especially so on the upper faces of the *Productus* beds where the shells seem to decay first; then begins a hole, which increases as the rock decreases, and in these holes grow many species of *Algæ*, especially *Ceramidæ*, *Cladophoræ*, and *Enteromorphæ*, but my attention was principally given to a few deep rock-pools in which *Laminaria*

digitalis grew covering them over with its broad dark fronds, and thus causing darkness sufficient for the more beautiful *Rhodospermæ*, to develope their fine colours, which otherwise with such clear water as surrounds the Island we could not have hoped for especially as the tide was not quite out, and to the perpendicular rock faces, where the rare *Gigartina Teedii* grows in profusion especially on one face which I waded to, and then scrambled up —here also *Tylota Sericea*, hung in graceful driplets, each plant retaining a drop of apparently ruby coloured water at its extremity, whilst to add to the beauty of this enchanting rock-face large tufts of *Chondrus crispus* grew at its base, giving out its resplendent opal like irridescent colours with every movement of the water ; but we have no time for the beautiful, we know that in less than two hours the ship gun will be fired and the work neglected can never be done again—so feeling a change of posture would be a relief, a move is made to a shallow weedy pool where *Janea rubens* is growing parasitic on various plants and *Melobesia Lichenoides* is covering every stone and rock with its delicate pink lichen-like self, where the rare *Cladophora uncialis* is in thousands, and where the *Ceramidæ* are the colour of the yellow pen I am writing with, in consequence of exposure to the sun's influence, instead of the beautiful reds they should be, when grown in dark pools. Bang goes the ship's gun again, and lo, one boat is seen laden and almost back to the ship ; we look up and see our president and some ladies scrambling down the rugged sides of the Island, this give us a few moments more, but at last we reluctantly quit the rocks ; and as we push off a fine "bird of the year," great black backed gull, came and stood on the rock above us just out of gun shot—a solitary but evidently a happy fellow ; a pair of puffins rushed head long past us and a few razor bills careened along the edge of the water, and we had finished our two hours at Puffin Island, with the following results :—

Fucus vesiculosus
F. serratus
F. nodosus
F. canaliculatus
Laminaria digitata
L. stenophylla var.
L. saccharina
Stilophora rhizodes
Asperococcus echinatus
A. vermicularis, var.
Cladostephos verticillatus
C. spongiosus
Sphacelaria plumosa *
S. cirrhosa
S. fusca
Ectocarpus littoralis
E. tomentosus
E. brachiatus
E. siliculosus
E. granulosus

Elachesta fucicola
Iridæa edulis
Catenella opuntia
Polyides rotundatus
Furcellaria fastigiata
Gymnogongrus plicatus
Chondrus crispus
C. norvegicus ?
Phyllophora rubens
P. membranifolia
Halymenia ligulata
Dumontia filiformis
Gigartina Teedii
Gelidium corneum, var.
Plocamium coccineum
Wormskioldia sanguinea
Delesseria sinuosa
D. alata
Laurencia pinnatifida
Chylocladia clavellosa
Ceramium ciliatum
C. acanthanotum
C. nodosum
C. diaphanum
C. Deslongchampsii
C. decurrens
C. rubrum
C. pellucidum ?
Ptilota plumosa
P. sericea
Dictyota dichotoma
Gracilaria confervoides
Rhodymenia palmata
Chylocladia articulata
Corallina officinalis
Jania rubens
Melobesia Lichenoides
Polysiphonia nigrescens
P. violacea
P. fibrata, *
P. pulvinata, *
P. urceolata
P. parasitica
Dasya coccinea, *
Bryopsis plumosa, *
Cladophora rupestris
C. lætevirens
C. flexuosa
C. refracta
C. uncialis
Rhizocloneum riparium, *
Conferva melagonium
Enteromorpha intestinalis
E. clathrata
E. ramulosa, *
E. percursa
Ulva Lactuca
U. Linza
Rivularia plicata

There still remains a few *confervæ* to be examined but thinking I have occupied too much space, and being otherwise engaged to day I send the result of our two hour's work on Puffin Island hoping it may induce others to go and finish the algæ of this interesting spot, merely remarking that we only examined a few, say at most three hundred yards in length of the north west shore, and as a general rule found the plants small.

Liverpool, June 26th, 1865.

* These species I have not seen, all else were gathered and examined by myself.

MATERIALS FOR A FLORA OF WAKEFIELD AND ITS NEIGHBOURHOOD.

By T. W. Gissing.

(Continued from page 34.)

V. angustifolia, R. Narrow-leaved Vetch. A. May—August. Heath and other places. A variety of the preceding.

V. lathyroides, L. Spring Vetch. A. May—July. Heath.

V. sepium, L. Bush Vetch. P. June—August. Common.

V. hirsuta, Koch.. Hairy Tare. A. June—August. Frequent.

V. tetrasperma, Koch. Slender Tare. A. June—August. Heath.

Lathyrus. *Linn.* Vetchling.

L. pratensis, L. Meadow Vetching. P. June—August. Common.

Orobus. *Linn.* Bitter Vetch.

O. tuberosus, L. Tuberous Bitter Vetch. P. April—June. Common. The narrow leaved variety *O. tenuifolius*, is occasionally found.

Order—ROSACEÆ.

Prunus. *Linn.* Plum and Cherry.

P. spinosa, L. Sloe or Blackthorn. S. April. Frequent.

P. Padus, L. Bird Cherry, S. T. May. Haw Wood.

P. avium, L. Wild Cherry. T. May. Hugset Wood, and other places near Barnsley. Sharlestone &c.

Spiræa. *Linn.* Dropwort or Meadow Sweet.

S. Ulmaria, S. Meadow Sweet. P. June—August. Common.

S. Filipendula, L. Common Dropwort. P. June—August. Smeaton, Went Hill.

Geum. *Linn.* Avens.

G. Urbanum, L. Common Avens. P. June—August. Common.

G. rivale, L. Water Avens. P. April—July. Burton Salmon, Mr. Roberts.

Agrimonia. *Linn.* Agrimony.

A. Eupatoria, Common Agrimony. P. July—August. Frequent.

Aremonia. *Neck.*

A. agrimonoides, Tourn. P. May—August. Pretty abundant by the Canal running from Stanley to the Calder.

POTENTILLA. *Linn.* Cinque Foil.

P. anserina, L. Silver Weed. P. June—August. Common.

P. verna, L. Spring Cinque-foil. P. April—June. Smeaton Crags, near Askern, Upper Ledstone, Ferry Bridge. (Miall.)

P. reptans, L. Creeping Cinque-foil. P. May—August. Common.

P. Tormentilla, Schk. Tormentil. P. June—August. Common.

P. Fraga riastrum, Ehrh. Barren Strawberry. P. February—May. Common.

FRAGARIA. *Linn.* Strawberry.

F. vesca. L. Wood Strawberry. P. April—June. Frequent.

RUBUS. *Linn.* Bramble, Raspberry.

* *R Idæus*. L. Common Raspberry. P. June—August. Chevet, Woolley Edge, Langley Wood, &c.

R. fruticosus, L. Bramble or Blackberry. P. May, and through the summer. Common.

R. cæsius, L. Dewberry. S. June—August. Frequent. Growing in shady places—along the edges of ditches, &c.; the fruit of this plant grows to a large size, and is very fine in flavour, superior to many fruits, used for dessert. In Suffolk—the fruit of the common brambles is usually called *mulberries*.

ROSA. *Linn.* Rose. Sweet Briar.

R. villosa, L. Villous Rose. S. May—July. Stanley, Thornes, &c.

R. canina, L. Dog Rose. S. May—July. Common.

R. arvensis, L. Trailing Dog Rose. S. June—July. Common.

SANGUISORBA. *Linn.* Burnet.

S. officinalis, L. Great Burnet. P. June—August. Frequent.

* I have followed Mr. Bentham in the arrangement of the Brambles.

Reports of Societies.

ZOOLOGICAL SOCIETY OF LONDON.
JUNE 27TH, 1865.

PROFESSOR HUXLEY, F.R.S., IN THE CHAIR.

An extract was read from a letter addressed to the secretary by Mr. R. Swinhoe respecting some Chinese Deer destined for the society's menagerie.

The secretary announced the safe arrival in the society's gardens on the previous evening of a young male African elephant, received in exchange from the Jardin des Plantes.

Mr. Busk communicated a memoir upon the fossil elephants of Malta, based upon collections formed in that island by Captain Spratt, R.N., which had been originally placed in the hands of the late Dr. Falconer for examination. Upon Dr. Falconer's decease Mr. Busk had undertaken the task of identifying these remains

which he was induced to refer to three species of the genus *Elephas*. One of these, not much inferior in bulk to the existing Indian elephant, was, as Mr. Busk believed, probably referable to *Elephas antiquus*. The two others were both of diminutive stature as compared with the existing species of elephant, neither of them having exceeded five feet in height. To one of these, slightly the larger of the two, Mr. Busk proposed to restrict Dr. Falconer's name *Elephas melitensis*, and to call the other and smaller one after the lamented naturalist who had done so much towards increasing our knowledge of these animals, *Elephas Falconeri*. The two latter species were distinguished by very well marked dental and other characters.

Mr. St. George Mivart read a paper on the axial skeleton of the Primates, in which the modifications presented by the vertebral column and the adjoining parts of the skeleton of this order of mammals were pointed out.

Dr. J. E. Gray pointed out the characters of a new genus of Delphinoid Whales from the Cape of Good Hope, proposed to be called *Petrorhynchus*, and gave particulars concerning other Cetaceans from the same seas, skulls of which had been submitted to his examination by Mr. E. L. Layard, curator of the South African Museum, Cape Town.

A joint paper was read by Mr. Bartlett and J. Murie on the movement of the symphysis in the lower jaw of the Kangaroos.

Mr. N. L. Austen read some notes on the habits of the Water Shrew, *Crossopus fodiens*, as observed in a state of nature and in captivity.

A paper was read by Professor Owen containing descriptions of new species of Indian Cetaceans, which had been observed and collected on the eastern coast of the Indian peninsula by Walter Elliot, Esq. Of the seven species described as new, six belonged to the family Delphinidæ ; the seventh was referred to the Sperm Whales, *Physeteridæ*, and proposed to be called *Physeter (Euphysetes) simus*.

A report was read by the Rev. H. B. Tristam on the Terrestrial and Fluviatile Mollusks collected during his recent expedition in Palestine.

Mr. Sclater read a paper on the genera and species of the family of Swifts *Cypselidæ*. Mr. Sclater was acquainted with about fifty well characterised species of this family divisible into two sub-families (proposed to be called *Cypselinæ* and *Chætúrinæ*), which together contained six genera.

A paper was read by Dr. P. Carpenter entitled—"Description of two species of Chitonidæ from the collection of W. Harper Pease." Dr. Carpenter also communicated a paper by Mr. W. Harper Pease, containing descriptions of new genera and species of Marine Shells from the islands of the central Pacific.

A paper was read by Ritter von Frauenfeld on some new species of Mollusks of the genus *Vivipara* in Mr. Cumming's collection.

Two papers were read by Mr. G. B. Sowerby entitled—"Descriptions of new *Scintillæ* and a new *Pythina*," and "Descriptions of new species of *Conus*."

Huddersfield Naturalists' Society.—This Society held a grand field-day on Saturday afternoon, June 21st, at the residence of their late President, Alfred Beaumont, Esq., the Greave, Wilshaw, near Meltham. Picturesquely seated at the the edge of lofty moorlands, forming a portion of the Penine chain which here divides the two counties of Laneashire and Yorkshire, and surrounded by fertile and well-wooded valleys, the effect heightened by the additions to the beautiful monumental Church recently ereeted by Joseph Hirst, Esq., to the memory of a beloved daughter, render Wilshaw an attractive spot not only to the avowed Naturalist, but to everyone who has an eye open to appreciate nature's beauties ; and while furnishing abundant material for study cannot but tend also to elevate the mind.

That these beauties are appreciated by this Society is shown by the fact that abont seventy members after enjoying a ramble on the neighbouring moors assembled with well filled vasculums, at the Greave, where an excellent tea was provided, after doing justice to which the ordinary business of the Society was proceeded with, Mr. B. Bradley, the president occupying the chair.

The Hon. Sec. Mr. S. Teale read the minutes of the last meeting, at which a proposal was made that during next year, the Society should publish a Fauna and Flora of Huddersfield and the surrounding district. This project was freely discussed, the feeling in its favour being unanimous.

The botanical specimens laid on the table were very numerous, there being no less than one hundred and thirty distinct species, Peter Inchbald, Esq., of Storthes Hall, first addressed the meeting on the subject of the various plants exhibited and was followed by Mr. W. Guthrie, and Mr. John Armitage. The following are some of the rarities exhibited :—

Actæa spicata (Liley Wood)
Lepidium Smithii,
Meconopis Cambricum
Spergula arvensis
Erodium cicutarium
Impatiens fulva (near Elland W. Guthrie.)
Genista tinctoria
Lotus corniculatus
Vicia Cracca
Trifolium procumbens
Geum rivale
Polemonium cæruleum
Myosotis palustris
M. sylvatica
Scrophularia nodosa
Scutellaria galericulata
Lysimachia nemorum
L. vulgaris
Plantago media
Polygonum Bistorta
Rumex cristata
Juncus bufonius
Epipactus latifolia
Tamus communis
Bryonia dioica
Ophioglossum vulgatum
Aspidium aculeatum
Galeopsis Ladanum

Alfred Beaumont, Esq., exhibited two very rare birds, one the Andulusian Hemipode, *Hemipodius tachydromus*, was recently taken alive, at Fartown, near Huddersfield, this is the second recorded capture of this bird in England ; the other Wilson's Petrel, *Thalassidroma Wilsonii*. Mr. Beaumont's collection of British Birds was a source of much gratification to the members present, besides the above mentioned specimens he has recently added an example of the Swallow Tailed Kite, *Falco furcatus*, caught a few years ago, in the woods of Bolton Abbey, Yorkshire. Mr. Beaumont also exhibited a case of sixty species of British *Phryganidæ*.

Some rare *Coleoptera* were also exhibited by Mr. W. H. Charlesworth.

Botanical Society of Edinburgh.

XXIX SESSION—VIII. MEETING.

The society met on Thursday, 8th June, in the Histological Class-room at the Royal Botanic Garden – Professor Balfour in the chair.

The following donations to the library were laid on the table :—Plants Indigenous to the colony of Victoria, Australia, described by Ferdinand Mueller, Ph.D., M.D., &c. Lithographs from the Victorian Government : Fragmenta Phytographiæ Australiæ, by Ferdinand Mueller, Ph.D., M.D., &c., from the same ; Proceedings of the Literary and Philosophical Society of Liverpool, 1863-64, from the society. Catalogue of British Plants, including the Flowering Plants, Ferns, and Characeæ, to which is appended a List of the Varieties of British Ferns, printed for the society, and published by Messrs. A. & C. Black ; Botanisk Reise i valdersog de tilgrændsende egne, af Axel Blytt, from the Royal University of Norway ; Les Ajuga Pyramidalis

et Genevensis, par M. Armand Thielens, from the author ; Observations sur Quelques Plantes rares ou nouvelles de la Flore de Belgique, from the author.

The following donations to the Herbarium were announced :—From Dr. W. F. Mactier, collection of Ferns from Penang : from Mrs. Bevan, per William Brand, Esq., plants from Mont Blanc : from James Backhouse, Esq., York, specimens of *Viola arenaria*, colected at Widdybank Fell, Teesdale, Durham, May 1865.

The following communications were read :—

I. Note on a New Gall from China. By Professor Archer.

Mr. Archer first referred to a gall described by Dr. Pereira, under the name of Woo-pei-tsze, which has recently been imported into this country for the manufacture of Gallic acid. Mr. Hanbury believes it to be produced on *Rhus semi-alata*, and Mr. Doubleday thinks it is caused by the puncturing of an aphis and not by a cynips. He next noticed a gall from India called Mahee, the produce of *Tamarix indica* and *T. turas*, and rich in Gallic acid ; also a a peculiar gall called Kakrasingee, yeilded by *Rhus Kakrasinghee* (Royle), and one from Southern Germany named Knoppern, produced on *Quercus Cerris*. In conclusion, he noticed a curious gall from Shanghai, resembling somewhat the Chinese and Japanese galls, but wanting their peculiar branched appearance.

II. Note on Cape Saffron. By Professor Archer.

This saffron is the produce of a plant belonging to the natural order Scrophulariaceæ, and is noticed by Dr. Pappé in his "Flora Capensis." It yields a good orange dye, and resembles common saffron in taste and smell.

III. Notice of Cubebs from Southern Africa. By Professor Archer.

Mr. Archer believed the cubebs to be the fruit of *Vepris lanceolata* (Jussieu), a plant belonging to the natural order Xanthoxylaceæ.

Specimens of the various galls, saffron, and cubebs referred to were exhibited.

IV. Notes on the destructive effects of Beetles on certain young Plantations. By Mr. James Myles, factor to Mr. Speirs of Elderslie. Communicated by Mr. Gorrie.

The plantations chiefly attacked are Wræs, Kirkton, and Borthwickfield—the former having been planted three years, and the latter two years. The plants in Wræs are so much injured that nothing can be done to save them, and cattle have been turned into the plantation. In Kirton more than one half of the plants are killed, while in Borthwickfield the number destroyed is considerably less than the half. The beetles attack the plants first at the base of the stem, eating and then puncturing the bark upwards. The plants destroyed are Scotch fir, larch, spruce, Austrian, Weymouth, and other coniferous trees and a few beech, birch, oak, and mountain ash. The beetles occur in great profusion and Mr. Myles gave a description of what he had done to diminish their numbers. Three boys were able to collect for some time between thirteen hundred to fourteen hundred beetles each day in the plantation, but they had so far diminished now that they could only gather six hundred or seven hundred a day. Mr. Myles sent specimens of the beetles and plants injured by them Mr. W. R. M'Nab, who had examined the insects, finds three different species, viz :—*Hylurus piniperda*, *Hylobius Abietus*, and *Otiorhynchus notatus*.

V. Notes of an Excursion from Simla to the Valleys of the Giri, Pabur, and Tonee Rivers, tributaries of the Jumna. By Dr. Cleghorn.

VI. Recent Botanical Intelligence. Communicated by Professor Balfour.

1. On examining the flowers of *Fumariaceæ* in their early development, M. Godron finds them quite regular, but flattened from before backwards, as if they were compressed between the axis of inflorescence and the bract. They preserved this regularity in *Dielytra*, *Adlumia*, and *Dactylicap-*

nos. In these three genera, the two external petals placed laterally, undergo during development an important modification. The base of each is prolonged into a short and rounded spur, and the two nectariferous appendages become finally quite regular. The two sepals placed superior and inferior also remain perfectly regular. Again in the genera *Fumaria* and *Corydalis* only one spur is developed, so as to render the flower irregular. This spurred petal becomes larger than its antagonist.

M. Godron has examined *Corydalis solida*, Sm. and *C. cava*, Schweigg in their early condition while still underground. He still traces the abortion of one of the spurs in the petals to the flowers during their development being compressed at the base on one side only. In this way development of the nectary and its appendages are prevented. M. Godron made experiments with the flowers of *Dielytra* so as to compress one of the petals at the base during its dovelopment, and he thus rendered it like *Fumaria*, with a single spurred petal. In *Diclytra* and *Adluma* the spurs develope at a later period than in *Fumaria*, and in such a way that the raceme, in elongating, separates the flowers from each other, and allows the free and equal formation of spurs. The regular form sometimes continues in the *Fumaria* and *Corydalis*. M. Godron has seen *Corydalis solida* assuming a pelorian form by two or even four petals becoming spurred or calcarate. The flowers in this case become sterile.

2. Bracts are generally wanting in the racemes of Cruciferæ. In some of the characteristic species we find bracts occasionally in the lower flowers. In *Sisymbrium supinum*, L., all the flowers are produced with a pinnatifid bracteal leaf, and the same is the case with *Sisymbrium hirsutum*, Lagasc. *Brassica oleracea* has been seen with large oblong bracts in connection with its lower flowers, while smaller bractlets occurred at the upper part of the raceme. Similar phenomena have been observed in *Erysimum cheiriflorum*, Wallr., *Arabis turrita*, L., *Hesperis matronalis*, L., *Bunias orientalis*, L. Sometimes the lower and middle part of the inner face of the bract becomes united to the base of the peduncle. This has been noticed in *Iberis sempervirens*, L., and in other cruciferous plants. Sometimes when the bracts are completely wanting, there are traces of the decurrence of leaves at the base of the naked peduncle.

High Wycombe Natural History Society.—The members of this society met on the afternoon of June 17th, for a ramble through Fennell's Wood, Loudwater. Their principal object was to ascertain whether the Bee Orchis still grew in that neighbourhood as it undoubtedly did some years ago; the search for it however was unsuccessful. Fine specimens of the caterpillars of *Vanessa Io*, the Peacock Butterfly, were seen on the nettles in Back Lane, and the contrast between the larva and the perfect insect was noticed, the former being jet black and sprinkled faintly with white dots. Several species of Bramble were gathered, also *Hypericum pulchrum*, one of the St. John's Worts, and *Epilobium angustifolium*, the "French Willow" of gardeners. A curiosity was noticed in the shape of a wild Cherry Tree, the top of which was almost eaten away by plant lice, (*Aphides*); on looking among these the ants were seen performing a friendly office to man in thinning their numbers. The only ferns seen in the wood were *Lastrea filix-mas*, and a few specimens of *Polypodium vulgare*; mosses were abundant, and so were *Agarics*. The pretty little Winter Green, *Pyrola minor*, had been said to grow in the road leading up from the station, but none of the members were able to find it. The overhanging banks were, however, richly decorated with the wild roses, particularly *Rosa canina* and *R. arvensis*. On the mullein were found very large larvæ of the Mullein Shark Moth *Cucullia verbasci*; the contrast between this and its imago is quite opposite to the one mentioned above, the caterpillar being

much more beautiful than the perfect insect. On a piece of waste ground the Dame's Violet *Hesperis matronalis*, was found. The return home after a few hours' ramble was enlivened by a discussion on the future existence of the lower animals. —Hy. Ullyett, Hon. Sec.

Observations.

The Zoological Society of London have just added to their living collection, a young male African Elephant. This being the first living example ever seen in England its arrival ought not to pass over without notice. W. J. W.

Variety of the Sparrow.—The other day a flock of sparrows flew into my garden, amongst which I noticed one which was white or rather pale grey. I do not know whether this is common amongst sparrows or not, but in this case there was no doubt of the fact. I sat quite close to them for nearly a quarter of an hour, and had plenty of opportunity for observation, unfortunately I do not possess a gun or I might have obtained the specimen.—Thomas Gregson Ponton, Clifton, *June 30th*, 1865.

Occurrence of the Norfolk Plover near Huddersfield.—A few weeks ago, two examples of the Norfolk Plover were seen at Dungeon Wood, near Huddersfield, one of them was shot by the gamekeeper, and is now in the possession of Mr. Armitage of Milnsbridge. This is only the second recorded instance of their occurrence in this neighbourhood.—J. Williamson, Paddock, near Huddersfield, July 10th, 1865.

Gallinula crex.—The other day as Mr. Briggs was walking from Cookham to Maidenhead, by the side of the river, with another man, he heard a Land Rail (*Gallinula crex*, Lath.), croaking in the grass a short way before him. It is one of Mr. Briggs' boasts that he can always "put up" one of these birds, if he once heard its note. He therefore walked along, beating the grass as he went with his walking stick. He failed to find the bird, but had not proceeded far, when he heard its note again behind him. He retraced his steps, and at last the bird got up close to the path. He threw his stick at it and had the good fortune to bring it down. It fell within a yard of the water's edge, and on Mr. Briggs going to pick it up, jumped up, and plunging into the river with a great spring, swam straight across to the other bank. I have sent this as it is new to me, and I dare say some of the readers of the *Naturalist* were not aware that the Landrail was a good swimmer. The Thames at this point is not less than seventy yards broad, and as one of its wings was injured, it is suprising how the bird managed to swim the distance.

I have lately enjoyed a week's stay at Cookham, and collected the following birds which I added to my collection:

Sylvia rubeta, Lath. Widbrook. Common.
Motacilla campestris. Pall. Widbrook. Common.
Sylvia sibilatrix, Bech. Formosa.
Totanus hypoleucos, Tem. Cockmarsh.
Sylvia curruca, Lath. Cockmarsh.
Columba Turtur, Linn. Cockmarsh.
Paris palustris, Linn. Holly Lodge.

The Cirl Bunting (*Emberiza cirlus*, Linn.) has been heard round Formosa. The number of Cuckoos seen this year in the neighbourhood of Cookham has been surprising.—R. B. Sharpe, 186, Strand.

Lacerta Agilis.—I shall be much obliged if any one can inform me of a locality or localities within thirty miles of London, where the land lizard (either brown or green) is to be found.—W. R. Tate, 4, Grove Place, Denmark Hill, London.

Notes on British Mosses. No. IV.

By C. P. Hobkirk.

Bartramia fontana. Brid.

This moss, commonly called Apple Moss, from the apple-like form of its fruit, is one

of our handsomest looking mosses when growing. It grows in wet marshy places, or near springs in hilly and mountainous parts of the country, and is in fruit in our neighbourhood in July. I have only met with it in one locality in this vicinity, viz: on some wet spongy ground, on the roadside near Dunford Bridge, at an elevation of about 1,100 or 1,200 feet above the level of the sea, in July, 1861. And this is the only one of the eight British species I have found near here. It belongs to the *Acrocarpi* or terminal fruited mosses, and the sub. order (xxiii.) *Bartramiæ*. The stems are upright, densely cæspitose, covered with fibres—from one to six inches high (my specimens are about three inches) growing in yellowish or glaucous green patches, with innovations generally just below the floral apex. Sometimes the branches are very short at the summit of the main stem, and sometimes longer and more scattered. The leaves are mostly ovate acuminate, sometimes longer and almost lanceolate, concave, sub-erect, or patent, and rather bluntly toothed towards the apex. The areolæ, are smallish, quadrate and elongate. The margin of the leaves is recurved below, the backs somewhat papillose, with a sub-excurrent nerve. The inflorescence is terminal and in this species dioicous, the barren flower being discoid. The capsule is globose, erect, large, of stout firm texture, and of a reddish brown colour when ripe. The peristome is double, the outer one being composed of sixteen equidistant lanceolate teeth closely barred, and of a pinkish red-colour ; the inner one is a membrane, yellowish, divided into sixteen keeled lanceolate processes, with cilia, sometimes two or three together. Spores large, subsphœrical, and reddish.

The genus has received its name from John Bartram an American traveller and botanist, the species from its habitat.

Syn :—

Bartramia fontana. Bridel. Swartz. Turner. Web and Mohr. Schwægr. Hook and Taylor. Bruch and Schimper.

Mnium fontanum. Linn. Hedw. Wahlenb.

Bryum fontanum. Swartz. Sm. E. B. t. 390. Dill. Musc. t, 44. f. 2.

Bartramia falcata. Hook. in Lin. Trans. vol. ix. p. 317 (in part).

News.

Important Contribution to the Leeds Philosophical and Literary Society. —The extensive and valuable collection of shells, corals, sponges, minerals, and volcanic rocks, formed by the late Mrs. Hobson, of Westhaugh House, near Pontefract (formerly of Leeds,) has been most liberally presented to the museum of her native town, by her nephew, Mr. Edward Armitage, of London. This collection consisting as it does of many magnificent specimens, will considerably enrich the museum of the Philosophical Society in many departments which were before deficient, or only represented by inferior specimens, more especially the minerals and corals.

Correspondence.

Konstanz, Baden, June 26th, 1865.

Knowing your devotion to Natural History, I propose to give you a few lines on the peculiarities of this district, lying on the shores of the Lake of "Bodensee", nearly 1400 feet above the level of the sea ; its climate is much more variable than that of dear old Yorkshire. We had five months of winter and snow ; the thermometer descending as low as 4° Fahrenheit. Three weeks ago, we had a temperature of 96° in the shade, and 130° in the sun ; flowers bloom and wither in half the time they would in England. Chaffinches are much more numerous here than sparrows ; this I attribute to the small quantity of grain grown in this neighbourhood. The blackstart is much more common than the red, I have two fine broods in my garden.—In the forests the woodpeckers

are continnally tapping ; but as to game birds and hares there are none ; in two years I have never seen a partridge. There was a legend that three hares were known within a circuit of two miles round Konstanz—they were known by the names of Hans, Peter, and Johann ; but as all the certificated shooters in Konstanz went after them every day I fear they have gone " to pot." A German sportsman is a peculiarity, with his gun, a great game bag in place of pockets, he thinks he has done well when he returns with a couple of blackbirds, a thrush, or two or three larks. Last year I was in the Foralberg at Whitsuntide, and they gave me black-cock and kapercailzies for my dinner, which had been foully murdered in the Tyrol ; just at the breeding time. The landlord was quite surprised at my remonstrances on killing birds which had probably a nest with half-a-dozen young ones in it. I have lent a friend, my copy of Bloch's fishes, I wished to refer to it, but he is fast asleep, seven a.m. We have two fishes which are comparatively rare in England, the "*Blaufeehen*" or *Salmo Wartmanni*, which I believe is the *Guinead*, another here called the gangfish, which I take to be a *Verdace*. Laing in his book on Norway, where he lived about two years makes a ridiculous blunder about fishes, he states that near Lillehammer on the lake Mosen, "*a fresh water lake*" that they catch and cure herrings. I was there four or five years ago, I found out what he had called *herrings* were grayling.

Mushrooms are unknown here, the people consider them as poisonous, on the other hand I consider their beef, mutton, &c., as poisonous, it is almost unateable to a John Bull, so I have become a demi vegetarian.

I have met with many fine specimens of the swallow-tailed butterfly, *Papilio podalirius*. I think the number of caterpillars, snails, grubs and other vermin is enormous—all my honeysuckles were destroyed and my pear and apple trees are blighted by them.—E. J. Maude,

Exchange.

I have the following insects in good condition to exchange for birds' eggs :—*P. Machaon*, *C. Edusa*, *V. polychloros*, *E. blandina*, *S. Tiliæ*, *A. Atropos*, *C. Elpenor*, *C. porcellus*, *D. Euphorbiæ*, *T. derasa*, *C. Jacobeæ*, *H. dominula*,—S. L. Moseley, Almondbury Bank, near Huddersfield. *July* 10*th*, 1865.

I have again fertile ova of *H. Dominula*, several friends to whom I sent it last year I believe failed to rear it, I shall now have pleasure in sending them another supply, also others who may require it as long as my stock holds out.—J. Steele, High Street, Congleton. *July* 10*th*, 1865.

Original Articles.

A BERKSHIRE RAMBLE.

By R. B. Sharpe.

This is the first time, I have found sufficient matter to form the subject of a paper, although I had intended to have made a record of a delightful walk I had on the 20th of May in company with my friends Messrs. Britten and Ullyett. I found there was nothing of interest as regards the birds, though my friends collected a great many plants, of which I do not

know the names. I shot for my collection a good male Whitethroat *S. cinerea*, Lin. and a little while after we found a nest of the same species with five eggs, on which the old bird was sitting. This, when disturbed, made a peculiarly harsh grating sound; the nest was in the top of the hedge close to the road. I afterwards shot on Cockmarsh, a hen linnet *F. cannabina*, Linn. which fell in the water, and was spoilt, but about five minutes after I shot the most splendid cock-bird I ever saw in my life, his breast was one mass of beautiful red feathers; I have made a good skin of him. We afterwards enjoyed a pleasant row on the river, and Mr. Ullyett obtained one or two shells, but they were not of much value. The ramble I wish to record is one I had on the 27th, and I think the most beautiful I ever enjoyed. I started from London by the 10. 25. Great Western Train, and arrived at Cookham about 11. 45. In the afternoon I walked out with my gun intending to shoot some of our summer visitants for my collection; I went through Cookham churchyard, and turned into some fields by the side of the river; a few swallows were flying over the tops of the standing grass, catching insects. *H. rustica*, Linn., is comparatively scarce in our neighbourhood to what it has been in former years, while *H. urbica*, Linn. is still rarer this year. The general scarcity of these birds seems to have been noticed all over the country. *H. riparia*, Linn. is commoner than I have before noticed it, as is *C. apus*; I walked by the side of the river about a hundred yards, when on the top of an old fence, which had once divided the field, I saw three birds sitting; I took them to be *H. rustica*, and two of *H. urbica*, my shot brought down two, which proved to be a male of *H. rustica*, and a female of *H. riparia*, so that if I had killed the third, which I plainly distinguished as *H. urbica*, I should have obtained three of the British Hirundines at the one shot. Leaving them at a post to be picked up on my return, I walked another mile without meeting anything worth notice. Arrived at Cockmarsh, I kept a sharp look out for the Yellow Wagtail, *M. flava*, Linn. but though there were plenty of the Pied Wagtail, *M. Yarrellii*, Gould, to be seen, I could not distinguish one of the former species. Cockmarsh is a large common, as level as a board, bounded on one side by a steep hill, which extends for a mile to the north, before it reaches Winter Hill, and Quarry-wood, where the woods continue for some way farther on. The incline is very precipitous and it is no little trouble to get to the top; a large holly hedge runs along the summit most of the way to Winter Hill. Here and there, on the incline, furze bushes are plentiful, and here I hoped to find some Stonechats,

S. rubicola, Lath. which was the object of my walk, but of them hereafter. The common stretches to the river in a level plain for nearly a thousand yards from the foot of the incline. The rifle butts are placed here, and it is one of the finest ranges in the country; a range of considerably over a thousand yards can be obtained by firing across the Thames. Cockmarsh is is a good place for birds; Mr. Briggs has shot here the Wheatear, *S. œnanthe* Lath., rather rare near Cookham, and several of the Snipes and Sandpipers. At the left hand side of the common by the river is a sandy cove where the latter resort. He once killed two of the common sandpiper, *Totanus Hypoleucos*, Tem. at one flying shot here; from the summit of the hill a magnificent prospect can be obtained of the country for miles round; which, after my recent experience of London smoke, I thought looked beautiful. I proceeded to the furze bushes, where, sure enough, was a female Stonechat, my shot missed her and she flew away unhurt. Having loaded my gun, I walked further on till I came to another detachment of furze, where I found my friend again hopping about from bush to bush, uttering her harsh "chat, chat." There was a plantation hard by and as I was afraid of disturbing the game, I allowed the Stonechat to rest and walked on. I could hear the Turtle Dove, *Columba Turtur*, Linn. and the Cuckoo, *Cuculus canorus*, Linn. mingling their notes in the plantation close to me. A nightingale *S. Luscinia*, Lath. popped out of a bush, not ten yards off, and began pecking; I did not disturb him, and he continued to peck vigorously for a minute or two, and then hopped into a hollybush, whence issued immediately a most melodious thrill, which however was not of long duration, as it was too early in the evening for his song. I saw him afterwards about twenty yards further down, hopping along the bottom of the hedge, and occasionally making a spring out on to the grass to pick up an apparently dainty morsel. This is the second time I have had the opportunity of observing the nightingale closely; the first, was in Huntingdonshire, about three years ago, about nine o'clock in the evening; I was walking through a hayfield at the time, when his song arrested my attention, and I managed to get close to him, so that he was on the one side of the hedge and I on the other, and, looking through the boughs, I could watch him easily. I noticed he sprang about on his perch, very like the way the Siskin does. But to return to my story, while watching the nightingale a fine Ring Dove, *C. Palumbus*, Linn. flew over my head, I also saw a male Kestrel, *F. tinnunculus*, Linn. hovering over the wood; these birds are not rare near Cookham. Down in the wheatfields below I heard the Landrail.

Retracing my steps homeward I found a Stonechat, this time sitting on the top of the hedge; my shot carried away the bough on which it sat, but I did not get my bird, as a large holly-bush and a deep ditch intervened, so I could not even see if I shot it; I was much vexed, as I have tried many times for these birds, to give to a friend in the north. Descending once more into Cockmarsh, I found a fine Yellow Wagtail; I shot at him and he fell, but when I went to pick him up he struggled into the air and flew away. Returning I saw another pair of these graceful birds, which I killed, and they are now in my collection; a minute after I noticed five Pied Wagtails mobbing a crow, which however, did not seem to care the least for his persecutors. Reaching the other side of the common I sat down on a stile to watch some riflemen, who were coming for practice; at the first shot, several birds flew up round me, and thinking to fire off my gun I shot at one which proved to be a splended male Redbacked Shrike *L. colluris*, Linn. the first I ever saw alive; they used to be common about Cookham; seeing a bird which I took for the female, I loaded, but could not find her; I then crossed a stile and soon afterwards shot a Whinechat, *S. rubertra*, Lath. and found the nest of the Sedge Warbler, *S. Phragmitis*, Bechst.; on my way I picked up the Swallow and Martin, and reached home about 8. 30.

186, *Strand, London.*

A WEEK ON THE COTSWOLDS.

By H. Ullyett.

After being so long in a chalky district a few days amongst the Cotswolds, was a very refreshing change. The liassic marlstone rocks crop out in the level country near the village of Stinchcombe, and are famous treasure stores for the geologist; the fossils are most abundant, especially several species of *Ammonites*, *Belemnites*, *Rhynchonella*, *Terebratula*, *Pholadomya*, *&c.* The quarries are known locally as "brown stone" quarries and have occasionally produced the remains of very fine Saurians. Some months ago a complete skeleton of one of these creatures was laid open to view by one of the labourers; but as he neglected to inform the owner until it was too late, it was destroyed by the boys pulling it to pieces. The owner said it was seven or eight feet in length. Gigantic specimens of *Pecten*

æquivalvis and of a species of *Gryphæa*, are found, and I was fortunate enough to obtain along with these, seven vertebræ that had lately been hewn out by one of the men ; to three of these portions of the ribs were attached ; three years ago a whole skeleton of a "*crocodile*" was dug out and sold to a gentleman near. Over the lias comes an immense mass of ferruginous sand; in some parts it appears like blocks, but they crumble at the touch of the hammer; this formation is seen to advantage on Long Down, near Cam. Hosts of sand martins *Hirundo riparia* rear their young in perforations in these banks, and are, by the height of their nests tolerably safe from all youthful collectors. No fossils appear to be found in the sand ; the sides of the hill are covered with the Brake *Pteris aquilina*, and stunted bushes of hawthorn, among which the Wheatear *Sylvia œnanthe*, Stonechat *S. rubicola*, and Gray Wagtail *Motacilla campestris*, build their nests. There is a very curious break between Long Down and an isolated conical hill called Peak Down ; the cliff at the end of the former is very high and steep, and a cart road runs along at the foot ; but the gap has not been formed I think by traffic, since the road is only used to fetch stones from a quarry. Perhaps it once had some connection with a short but deep watercourse that runs from the top of the Down eastward.

On the summit we come to the inferior Oolite, which is, in this locality, as rich as the Lias in organic remains ; just at the head of the water course some rocks crop out, about three feet in thickness, in which is a stratum of *Astarte obliqua*, *A. elegans*, and *Ammonites*, piled thickly over each other ; just above it is a soft layer, in which are embedded countless *Belemnites*, many of which show the phragmacone ; nearly all lie in a horizontal position, and all I had to do was simply to sit down and gather what I wanted. Further along in places that had been frayed out, so to speak, by the rabbits and sheep in forming places of shelter, I picked up good specimens of *Modiola plicata*, *Cenomia concentrica*, *Pecten lens*, and others that I have not yet identified. *Terebratulæ* lay about by dozens ; there are one or two places in the neighbourhood where Oolite fossils are to be found, but nowhere are they are so abundant as on Long Down, which I have visited at intervals for several years.

I had heard and read much of Minchinhampton and its fossils, so I paid it a visit, which I am sorry to say ended in disappointment, for many of the old quarries have not been worked for some time and the new ones do not yield so well. I visited five quarries, two of which were being worked, and was told by the men that few shells were found there now; but they

directed me to Birley Quarry (I cannot answer for the orthography of this name), about half a mile further on, where one of the men, known as Silas Cooper, had five or six thousand (?) that he had laid by for sale. After considerable difficulty I found Silas but as his fossils (he did not confirm the statement as to numbers) were at home and he could not get there till late, I was no better off than before; he also said they were scarcer than formerly. So after a walk of about twenty miles I reached home with no fresh, and very few familiar ones. The scenery however was very delightful and repaid me for my ramble. I took a fine large specimen of *Cetonia aurata*, the Rose Beetle, flying over the hill, and dislodged from beneath a stone *Carabus violaceus*. The Black Mullein *Verbascum nigrum* was as plentiful among the debris of the quarries as it is in the lanes and fields near Wycombe, but I could not see any trace of the larvæ of the Shark Moth *Cucullia verbasci*, that is there so plentiful. One good sized plant of *Atropa Belladonna*, grew on the hill ; the Hound's Tongue, *Cynoglossum officinale* was rather abundant just outside a garden. The Red Campion, *Lychnis diurna* which is unknown in our neighbourhood, is there very common, while the White, *L. vespertina*, and the Bladder Campion, *Silene inflata*, were sparingly distributed. The Yellow Water Lily *Nuphar lutea* had taken complete possession of a large pond in the Cam valley and in a stream close by was the Flowering Rush, *Butomus umbellatus*. In the deep lanes and water courses the ferns luxuriated, particularly the Hart's Tongue, Lady Fern, Shield Fern, with the mural species *Ceterach officinarum* and *Asplenium Ruta-muraria*. The multifid varieties of *Scolopendrium vulgare* are not at all rare, many specimens may be seen divided and sub-divided six or seven times. Game is very plentiful in all that part of the country ; as I walked along the summit of Long Down the rabbits scampered down the slopes in little flocks, and in many spots they had made the ground quite hollow by intricate burrowings ; black specimens are occasionally seen. " Reynard" may frequently be seen stealthily creeping along the hedges ; I once saw five in one morning's walk, and pheasants walk along the road in front of your vehicle with the utmost unconcern, merely turning through the hedge into the field as you get near them. I never saw the Humming Bird Hawk Moth, *Macroglossa stellatarum* to such advantage as in my walks along the slopes of these hills ; they were there as common as the little tortoishell, spinning up and down the stony banks, now darting away to a fresh spot, and now hovering over the thistle flowers, as they probed them for their sweets, and looking like stars as I watched them,—it was a sight to be remembered. It is of no use attempting to net them as

they fly, their movements are so sudden and rapid, and as one never sees them alight there is little chance of success, except near a bed of flowers. They appear fond of the thistle, and by these you must stand and wait for them patiently till they come, then, while they are balancing themselves in the air you can secure them by a strong sweep of the net. But their beautiful light colored heads do not keep their color after death, it grows darker ; so that after capturing just what you want to fill your cabinet and to supply your brother student it is much pleasanter to stand still and watch them than to deprive them needlessly of that life they so evidently enjoy. Do they discover their food by scent, or by sight? As I watched them it struck me that scent had very little to do with it, for though numbers of them flew past none stopped at the flowers unless they almost flew against them ; then they stopped immediately and were certainly pleased with what they found. The mouth of this insect is a wonderful piece of mechanism ; there appear to be two lower lips opening downwards and outwards, and inside them lies the long proboscis safely coiled up.

High Wycombe.

MATERIALS FOR A FLORA OF WAKEFIELD AND ITS NEIGHBOURHOOD.

By T. W. Gissing.

(Continued from page 81.)

Poterium. *Linn.* Salad Burnet.

P. Sanguisorba, L. Common Salad Burnet. P. June—August. Frequent.

Alchemilla. *Linn.* Lady's Mantle.

A. vulgaris, L. Common Lady's Mantle. P. June—August. Common.

A. arvensis, Sm. Parsley Piert. A. May—July. Common. In some parts called Parsley—Breakstone.

Cratægus. *Linn.* Hawthorn.

C. Oxyacantha, L. Hawthorn, Whitethorn. May. S. T. May—June. Common.

Pyrus. *Linn.* Pear.

P. Malus, L. Crab Apple. T. May. Snapethorpe, &c.

P. Aucuparia, Gaert. Mountain Ash, Roan Tree. T. May—June. Occasionally in woods and hedges. It is said "that witches have no power where there is *roan-tree* wood."

ORDER—ONAGRACEÆ.

EPILOBIUM. *Linn.* Willow-herb.

E. angustifolium, L. Rosebay Willow Herb. P. June—July. Oakenshaw Railway Embankment, Horbury Cutting. Scarcely wild.

E. hirsutum, L. Great Hairy Willow Herb. Apple-Pie. Codlings and Cream. P. June—August. Common.

E. parviflorum, Schreb. Small-flowered Willow Herb. B. June—August. Heath, &c.

E. montanum, L. Smooth-leaved Willow Herb. P. May—July. Common.

E. roseum, Schreb. Pale Smooth-leaved Willow Herb. P. July—August. Heath near Wakefield.

E. palustre, L. Marsh Willow Herb. P. July—August. Bogat Heath.

E. tetragonum, L. Square Stalked Willow Herb. P. July—August. frequent.

CIRCÆA. *Linn.* Enchanter's Night Shade.

C. lutetiana, L. Common Enchanter's Night Shade. P. June—August. Horbury, Ossett, Thornes, Westgate Common, &c.

ORDER—HALORAGIACEÆ.

HIPPURIS. *Linn.* Mare's Tail.

H. vulgaris, L. Common Mare's Tail. P. July—August. Campsall.

MYRIOPHYLLUM. *Linn.* Water Milfoil.

M. spicatum, L. Spiked Water Milfoil. P. June—July. Frequent.

M. alterniflorum, D.C. Alternate flowered Water Milfoil. P. May—August. In the Horbury Canal, and at Campsall.

ORDER—LYTHRACEÆ.

LYTHRUM. *Linn.* Purple Loosestrife.

L. Salicaria, L. Spiked Purple Loosestrife. P. July—September. About Pontefract (Mr. Roberts,) Ackworth (Mrs. Watson.)

PEPLIS. *Linn.* Water Purslane.

P. Portula, L. Common Water Purslane. A. June—August. Frequent.

ORDER—CUCURBITACEÆ.

BRYONIA. *Linn.* Bryony.

B. dioica, Jacq. Common Bryony. S. May—July. Frequent. Known in in some parts as Mandrake.

ORDER—PORTULACEÆ.

MONTIA. *Linn.* Blinks.

M. fontana, L. Water Blinks, or Chickweed. A. April—July. Common.

ORDER—SCLERANTHACEÆ.

SCLERANTHUS. *Linn.* Knawel.

S. annuus, L. Annual Knawel. A. July. Common.

ORDER—CRASSULACEÆ.

SEDUM. *Linn.* Stone-crop.

S. acre, L. Biting Stone-crop. P. June—August. Frequent on old walls.

ORDER—GROSSULARIACEÆ.

RIBES. *Linn.* Currant and Gooseberry.

R. nigrum, L. Black Currant. P. April—May. Ardsley (Mr. Roberts.)

R. rubrum, L. Red Currant. P. March—May. Occasionally naturalised, Ardsley, (Mr. Roberts.)

R. Grossularia, L. P. March—May. Occasionally naturalised.

ORDER—SAXIFRAGACEÆ.

SAXIFRAGA. *Linn.* Saxifrage.

S. tridactylites, L. Rue-leaved Saxifrage. A. April—June. Smeaton, Womersley, Conisbro' &c.

CHRYSOSPLENIUM. *Linn.* Golden Saxifrage.

C. oppositifolium, L. Opposite-leaved Golden Saxifrage. P. April—June. Ardsley, New Miller Dam, &c.

PARNASSIA. *Linn.* Grass of Parnassus.

P. palustris, L. Grass of Parnassus. P. August—October. Garforth. Brockerdale. Glass Houghton, (Mr. Roberts.)

ORDER—UMBELLIFERÆ.

HYDROCOTYLE. *Linn.* Marsh Pennywort.

H. vulgaris, L. Marsh Pennywort. P. May—July. Common.

SANICULA. *Linn.* Sanicle.

S. europæa, L. Wood Sanicle. P. June—August. Frequent in Woods.

CONIUM. *Linn.* Hemlock.

C. maculatum, L. Common Hemlock. B. June—July. Frequent.

The trivial name of this plant is given, in some parts of the eastern counties, to all *hollow-stemmed* Umbellifers—all alike being known as "Humlocks"

HELOSCIADIUM. *Koch.* Marshwort.

H. nodiflorum, Koch. Procumbent Marshwort. P. June—August. Common.

H. inundatum, Koch. Least Marshwort. P. June—August. Sharlestone.

ÆGOPODIUM. *Linn.* Gout Weed.

Æ. Podagraria, L. Common Gout Weed. P. June—August. Borders of Gardens, or near habitations.

BUNIUM. *Koch.* Earth Nut.

B. flexuosum, With. Common Earth Nut. P. May—July. Common.

PIMPINELLA. *Linn.* Burnet Saxifrage.

P. Saxifraga, L. Common Burnet Saxifrage. P. June—August. Common.

SIUM. *Linn.* Water Parsnep.

S. angustifolium, L. Narrow-leaved Water Parsnep. P. July—September. Burton Salmon, (Mr. Roberts.)

ŒNANTHE. *Linn.* Water Dropwort.

Œ. fistulosa, L. Common Water Dropwort. P. July—September. Heath, Sharlestone, &c.

Œ. crocata, L. Hemlock Water Dropwort. P. July—August. By Stanley Canal, near Heath Bridge.

NOTES ON THE *MUSTELIDÆ* OF NORTHUMBERLAND.

No. 3 :—PINE MARTIN. (*Martes abietum.*)

BY T. H. GIBB.

The agile martin—the most graceful but unhappily the rarest of all our *Mustelidæ*, is extremely local in its distribution throughout Northumberland, and although there are numerous localities in the county seemingly well suited to its habits and general economy, I am enabled only after diligent search and enquiry to record the capture of three individuals during a period ranging over twenty years. The first of these which I had the pleasure of observing alive in confinement, was trapped in May in the year 1846, in the Cawledge North Wood, a narrow belt of timbered land situated within two miles of Alnwick. When the animal was taken from the trap, which was done with no little difficulty as it kept up an unceasing defensive hostility all the while the kindly office was being performed, it was placed in a large cage and thence removed to Alnwick where it was exhibited as a *rara avis*. During its public exhibition the captive proved himself worthy of the common character for cleanliness bestowed upon his species viz :—that of "*sweet martin*," by which cognomen it is best known in Northumberland—for a less noisome and a more cleanly and spirited little animal I have never beheld.

Its incarceration seemed peculiarly irksome to it at first, as it bounded about its cage exhibiting a vast amount of impotent rage, but by degrees it calmed down and at length remained quiescently coiled up in a corner of its prison, its head completely hidden from view, either in the ample vesture of its own beautiful fur, or amongst the soft hay which composed its bed; but when aroused by even a gentle touch with a stick, it was instantly on the *qui vive*, and placed itself in such an attitude of self-defence as the nature of the disturbance seemed to it to require; deftly and determinedly pourtraying all that innate aptitude for pugnacity, for which the species stands pre-eminent. Notwithstanding that every care was taken of him, he sickened and died on the third day of his captivity.

The second capture was made in Dilston Park wood, on the river Tyne, about twelve years ago by George Marsh, a woodman, on the Greenwich Hospital estate, of which Dilston Park forms a part. From Marsh's testimony, it appears he came upon the slot of the Martin during winter in the snow, and although well versed in woodcraft, he was quite at a loss to know by what animal the slot in question had been made, and being determined to ascertain the fact, he followed the trace of the animal throughout all its intricate windings into a thick undergrowth of gorse where it had taken refuge, From this retreat Marsh speedily expelled the mysterious fugitive, when, to his astonishment, it ran up the perpendicular trunk of an adjacent tree and was quickly lost to sight amongst the thick matted branches overhead. Here however it found but a temporary asylum for it was discovered and ultimately shot by its relentless pursuer. It is now in the possession of Mr. Baty, Post-master of Hexham. Since this adventure and capture, Marsh, whose occupation requires him to be often in the woods, has frequently observed their footprints in the snow, and on one occasion, as the local votaries of the chase were having their accustomed run after Reynard,he witnessed some of the outside hounds at fault on the illegitimate scent of a pine Martin, and apprising the huntsman of the fact, this worthy disciple of Nimrod uttered a loud anathema not intended for "*ears polite*," against all Martins in the neighbourhood; evincing a knowledge that such an interruption was not of unfrequent occurrence during the excitement of the chase. The dense woods about Dilston and the coverts lying contiguous are the only places in Northumberland where the Martin is at present permanently resident; but, even here, abundantly favoured as it is by nature for their habitat, and notwithstanding the testimony of one or two persons residing in the locality, who reiterate their belief that they are still compa-

ratively numerous, I believe them to be very rare. Were such not the case, stray individuals would be more frequently seen in other parts of the county and we should certainly have to record more captures in the vicinity in question. The third and last-authenticated capture is of a very recent date, so lately as the 6th of May of the present year. This specimen was trapped in a locality far removed from those wooded fastnesses in which the pine Martin is usually found—in the centre of a large tract of moorland, within seven miles of Alnwick, partially covered with gorse and furze.

The singularity of a Martin having been taken in a situation so foreign to its habits and pursuits, and so much at variance with my own former knowledge of the animal, took me not a little by surprise; but the day after its capture it was sent to me, and on carefully examining it, I found the right fore leg amputated by the elbow joint; this at once solved the mystery, for doubtless the animal had been necessitated to leave its genial woods from its incapacity for climbing, to seek, by a compulsory exile, an existence far apart from its kindred species. It was a very aged animal, as was seen by the decayed molars and broken canines. In imagination we look back a few years and fancy we see poor "*Martes*" writhing in agony in the trap, when by a convulsive effort, or, by deliberately eating through alike its own flesh and sinews with that stoical indifference to pain which we know some of our *Mustelidæ* possess, it regains its freedom minus a limb, and days afterwards we can imagine him essaying his first attempt to reach some elevated retreat; it may be the deserted nest of a magpie—a kestrel—or the snug soft home of the squirrel, far up in the topmost branches of some lofty monarch of the forest; and see all his efforts signally fail him —while the "argus eyed" pheasant and coy ring-dove look on exultantly and mock his abortive attempts, and who for aught he can do now in his nocturnal forays, sit night after night securely on their accustomed perch. At length worn out with futile attempts to eke out an existence in his native woods—woods perchance casting their shadow "far o'er the borders," he becomes a solitary wanderer and visiting this rabbit burrow, and then the other, the wary occupants of which furnish him with occasional meals—he reaches, and it may be inadvertently, the bleak heath clad moors of Northumberland where he is again beset with dangers, and while plying his subtle energies in the capture of *Lepus timidus* is again taken in the "treacherous trap," this time however with a fatal result; for he is caught by the remaining fore-leg, which incapacitates him for again making his escape. The length of this individual is two feet four inches, including the tail which is nine inches

long ; height at the shoulder seven and a half inches ; weight two pounds four ounces. Its hair is of a long soft and silky texture, and in colour is one uniform rich dark fawn, with the exception of the tail and abdomen ; the former being darker at the tip—the latter partaking more of a slaty tinge. The breast, throat and cheeks are of the usual pinky salmon colour. It is yet I believe, a mooted question as to whether *Martes abietum* and *M. Foina*, are distinct species. The chief, and in many cases, the only distinction, according to some observers is in the difference of the throat which in *M. abietum* is yellow, and *M. Foina* white ; and hence arises the diversity of opinion which is to be met with on the subject, for these features are so variable at different times that through age, change of season, or other natural causes, the rich tint of the former animal gradually fades into and assumes the lighter colour of the latter ; and *vice versa*, the latter that of the former. Such a method therefore of distinguishing them, if not entirely discarded, must be at least held subservient to greater and less arbitrary differences that exist between them, which on a strict comparative analysis will be found abundantly palpable, and now, generally admitted by all those who have had an opportunity of carefully comparing the two together. The general appearance of the respective animals will be found widely to differ. *M. Foina* is markedly greater in bulk than *M. abietum*, and possesses to outward appearances a more robust and wiry constitution ; as is shown by its shorter and proportionably stronger limbs, the heavier body, and deeper chest. Its head too, is rounder and fuller, and its snout less pointed than that of *M. abietum*, which is acute and greatly resembles the common rat *Mus decumanus*.

It is also affirmed, but I have had no opportunity of proving or disproving the assertion myself, that the Beech Martin is more prolific than its congener the Pine Martin, which, if correct, "at once establishes the distinction of the species." If these deductions be true, and I believe them to be so, I am not prepared to place *M. Foina* in the *Mustelidæ* of Northumberland, as it has not to my knowledge been met with in the county. Like the Pine Martin it may be considered rare amongst British quadrupeds ; and except in a few of our more wooded and rocky English counties, where a few still linger : the extensive pine forests of Caledonia or the wooded mountainous districts of Wales must be traversed to meet with them in anything like their pristine numbers.

Alnwick, July 1865.

News.

Occurrence of the Night Heron in Cheshire.—A few days ago, a very fine specimen of the night heron *Nycticorax ardeola*, measuring twenty inches, with plumes seven inches long, was shot by a person named Smith, near the Mersey, at Gatley, Cheshire.—*Sporting News.*

A Large Brood of Partridges.—In the third week of last month Mr. Samuel Cock, of Little Trewollock, St Wenn, walking out in a meadow adjoining his house, found a partridge on her nest. Watching almost daily for the absence of the bird, he had the opportunity of counting the unusual number of nineteen eggs, a hen, or barn-door fowl having deposited one of hers to make the twentieth. The old bird completed her term of incubation on Wednesday in last week, going off with her entire brood of nineteen, leaving the hen's egg unhatched.—*Western Daily News.*

Reports of Societies.

Richmond and North Riding Naturalists' Field Club.—Monthly meeting, Tuesday, July 11th. Mr. Jas. Ward, F.B.S., in the chair.

The chairman exhibited a quantity of plants which he had collected during a tour in Switzerland in May and June last, amongst which were the following :—

Ranunculus alpestris, Aconitum Napellus, Dryas octopetala, Helleborus fœtidus, Chenopodium olidum, Chenopodium polyspermum, C. murale, C. hybridum, Mercurialis annua, Hieracium amplexicaule, Senicio paludosus, Gentiana acaulis, and *G. verna, Hypochœris maculata, Silene nutans*, and *S. Otites, S. acaulis, Dianthus Caryophyllus, Arenaria ciliata, Cerastium latifolium, Asperula Cynanchica, Staphylea pinnata, Phyteuma spicata*, and *P. orbiculare, Pyrola secunda, Bupleurum falcatum, Caucalis daucoides, Isatis tinctoria, Thlaspi perfoliatum, Draba aizoides, Alyssum calycinum, Echium violaceum, Saxifraga oppositifolia, Veronica saxatilis, Calamintha acinos, Bartsia alpina, Salvia pratensis, Leonurus Cardiaca, Ajuga Chamæpitys, Pinguicula alpina, Herniaria glabra, Medicago sativa, M. falcata*, and *M. minima, Onobrychis sativa, Sedum glaucum*, and *S. sexangulare, Rumex pulcher, Arctostaphylos alpina*, and *A. Uva-ursi, Potentilla argentea, Rosa alpina, Cotoneaster vulgaris, Euphorbia Esula*, and *E. Cyparissias, Polygonatum verticillatum, P. multiflora, Epipactis palustris, Epipactis rubra*, and *E. grandiflora, Cypripedium Calceolus, Herminium Monorchis, Corallorhiza innata, Brachypodium pinnatum, Bromus erectus, Eriophorum alpinum, Luzula Borreri, Typha minor*, together with many exotic medicinal plants, also a quantity of British medicinal plants in a fresh state.

The Secretary (Mr. J. Aspdin) exhibited a nest of the Hooded Crow *Corvus cornix*, which had been taken by Mr. Savage on the Hornby estate ; it contained four eggs, but the female having been trapped the male revenged himself by breaking them. Mr. Aspdin remarked that this was the first instance he had known of its breeding in the neighbourhood. He also exhibited a damaged specimen of the Death's Head Moth *Acherontia Atropos*, taken in a beehive at Richmond, on the 14th of June ; this he considered very early for the appearance of this moth. Mr. W. Hanxwell exhibited some specimens of coal from a vein at the Round Howe, near Richmond. The meeting then adjourned to the second Tuesday in August.—J. Aspdin, Sec.

Original Articles.

THE VEGETATION OF SPITZBERGEN COMPARED WITH THAT OF THE ALPS AND PYRENEES.

By Chas. Martins,

Prof. of Natural History, and Director of the "Jardin des Plantes," &c., at Montpellier. *

INTRODUCTION.

Situate under the meridian of Central Europe, and of the Scandinavian Peninsula, between 76°30 and 86° 50 N. Latitude Spitzbergen is, so to speak, the outpost of our Continent towards the North. In these islands where winter reigns for six months in the year, organic life almost becomes extinct for want of heat and light; here it is that the naturalist gathers the last plant and observes the last animal; here is the extreme limit of the Fauna and Flora of Europe. Beyond all is death and a bank of eternal ice extends to the northern pole. In Spitzbergen itself the snows only melt towards the edge of the sea in privileged localities, but the mountains always remain white even during the three months of summer. All the valleys are piled up with massive glaciers, which descend to the sea level; so that these islands are a faithful image of that geological epoch which immediately preceded our own,—the glacial. During this period a mantle of ice covered the whole of the North of Europe as far as the 53rd degree of latitude. All the mountain valleys, such as the Vosges, the Jura, the Alps, the Pyrenees, the Carpathians, the Caucasus, the Himalaya and even those of New Zealand, were occupied by glaciers, which extended to a greater or less distance over the neighbouring plains. Spitzbergen realizes then, before our eyes, the image of a geological phase of which the traces are almost everywhere recognizable. The small number of animals and plants which inhabit these islands are such as can best resist the cold, and require the least amount of solar heat, the source of all organic life. Under this double point of view the vegetation of this portion of the Arctic lands traced out by a traveller who has seen it under two different aspects and completed by the study of ancient and modern explorations deserves to be well known by all Naturalists interested in Botanical Geography.

* Translated with the Author's permission from the "Mémoires de l'Académie des Sciences et Lettres de Montpellier t. vi. p. 145, 168.—1865.

The Archipelago of Spitzbergen is composed of one principal island which gives its name to the whole group, and of two other large islands, the smaller one to the south, the larger one to the north. Prince Charles' Island is situated on the western coast, and a chain of little islets called the Seven Isles, stretches away directly towards the pole. Table Island is the last rock which raises its head out of the glacial sea.

I.—CLIMATE OF SPITZBERGEN.

When we recollect that in Spitzbergen the sun's altitude never exceeds 57° even in the most southerly parts ; that his oblique rays, traversing an enormous thickness of the atmosphere, do not reach the ground until they have lost nearly all their heat, and only graze, so to speak, the surface of the soil, instead of striking it perpendicularly, as in warmer countries ; if in addition to this we reflect, that this luminary is totally invisible from the 26th of October to the 16th of February, a night of four months duration thus enveloping this glacial land ; and further, that during the one hundred and twenty-eight days when night alternates with day-light, the sun is scarcely elevated above the horizon ; we may easily comprehend that the climate of Spitzbergen is one of the most rigorous. The continual presence of the sun during four months, does not compensate for his total absence during a similar period, nor for the obliquity of his rays ; besides, in the months of July and August his disc is generally hidden by the dense mists which arise from the sea. Never is the sky clear for a whole day together. Again, violent winds, cooled by contact with icebergs and glaciers, return after short intervals to lower the temperature of the atmosphere. Nevertheless, the climate of Spitzbergen is not so cold as some of the northern parts of America, situate under the same parallel of latitude, as the extremity of Baffin's Bay, known as Smith's Sound. It is in this region that meteorologists place the pole of greatest cold in the northern hemisphere, which does not coincide with that of the earth, but is found in America in 98° W. Lon. and 78° N. Lat. If the climate of Spitzbergen is less rigorous than that of these continental regions, it is because the former is an archipelago, the waters of which are warmed by the Gulf-stream,—that grand current of tepid water, which, born in the gulf of Mexico, traverses the Atlantic, and expires in the White sea, and on the western shores of Spitzbergen. Thus the latter are always open in summer, whilst the eastern coasts, blocked up by floating icebergs, are rarely accessible, even to the fishers for seals and walruses, which alone frequent these desolate shores.

I shall not fatigue the reader with the methods I have adopted, and the calculations I have made, for determining the mean temperature of Spitzbergen. I have made use of the observations of Phipps, Parry, and Scoresby, and those of the Northern Scientific Commission for Spitzbergen and Lapland. My results being in close agreement with those of Scoresby, deduced from his own personal observations, the figures obtained merit the confidence of scientific men. Like him I have calculated the temperatures for the middle portion of the island situated under the 78° of latitude. The following table shews the mean temperature for each month in centigrade degrees.* In order that the reader may arrive at a just idea of the rigour of this climate, I have added the corresponding temperature for Paris, calculated by M. Renore, and based on the observations of forty-five years, (1816 to 1860) made at the Paris Observatory.

MEAN MONTHLY TEMPERATURE IN SPITZBERGEN UNDER 78° N. LAT. AND PARIS UNDER 48° 58' N. LAT.

	Spitzbergen.		Paris.	
	Cent.	Fahr.	Cent.	Fahr.
January	—18.2	—1	2.3	36
February	—17.1	1	3.9	39
March	—15.6	4	6.3	43
April	—9.9	14	10.0	50
May	—5.3	22	13.8	57
June	—0.3	33	17.3	63
July	2.8	37	18.7	66
August	1.4	35	18.5	65
September	—2.5	27	15.5	60
October	—8.5	17	11.2	52
November	—14.5	6	6.6	44
December	—15	5	3.5	38

The mean of the year is thus —8.6 (16° Fahr.) that of Paris being 10.6 (51° Fahr.) the difference being 19° (35° Fahr.) the mean temperatures are not sufficient to characterise well the climate, for the same mean may correspond with very different extremes. The following extreme temperatures have been observed in Spitzbergen from April to August. In April Scoresby has not seen the thermometer in the sea elevated above —1.1 (30° Fahr.) In May the highest temperature was 1.1 (34° Fahr.) The Thermometer only six times reached above the freezing point, the month of May being thus still a

* For the convenience of English readers, we have added columns giving the nearest approximate temperature on Fahr. scale.—[*Eds. Nat.*]

winter month. In June the thermometer frequently rose above zero, (32° Fahr.) and Scoresby has seen it mark 5.6 (42° Fahr.) ; but in 1810 it descended to —9.4 (15° Fahr.) in July I have never seen it above 5.7 (42° Fahr. nor below 2.7 (27° Fahr) ; we thus see that the temperature is remarkably uniform, not varying more than three degrees ; the same phenomenon takes place in August when I have seen under 78° N. Lat. a thermometer in the sea oscillate between 1. 2 and 3°. In order to give an idea of the absence of heat in Spitzbergen I may say that during the eleven years from 1807 to 1818, Scoresby only once saw the thermometer mark 14.4 (58° Fahr.) on the 29th of July 1815 ; Parry, 12.8 (55° Fahr.) on the 19th of July 1827; and myself 8.2 (47° Fahr) in August 1838. The highest temperature noticed is 16° (61° Fahr) by the Swedish expedition on the 16th of July 1861. As to the cold we have no positive information for winter, but it is probable that the mercury would be frequently frozen and the thermometer would fall often to between —20° (—4° Fahr) and —30° (—22° Fahr), for Scoresby has observed it at —17.8 (0° Fahr) on the 18th April 1810 and even —18.9 (—2° Fahr) on the 13th of May 1814. Snow falls during every month of the year. In the anchorage of Magdalena Bay in 79° 34′ N. Lat. the Corvette ' La Recherche' was covered with snow during the first days of August 1839. In Scoresby's journal there is not a month in which a fall of snow is not mentioned. The weather is remarkably inconstant, calms and violent gusts of wind rapidly alternating. The sky, serene for several hours becomes covered with clouds; the fogs are almost continual, and of such a density that objects cannot be distinguished beyond a few paces, and these fogs, humid, cold, and penetrating, generally wet like rain. Storms are unknown in these parts even in summer time ; the roll of thunder never breaks the silence of these desert seas. On the approach of Autumn the fogs increase, the rain changes to snow, and the sun rises less and less above the horizon, its light becoming gradually enfeebled. On the 23rd of August that luminary sets for the first time in the north, the night being but a prolonged twilight ; but from this date the length of the day rapidly diminishes until at last on the 26th of October the sun finally descends beneath the horizon. For some time yet, the reflection of an aurora which no longer announces the rising of the sun, illumines the sky about midday, but this light becomes gradually of shorter duration, and paler, until it is completely extinguished. The moon is then the only orb which enlightens the earth, and her wan light reflected from the snows reveals the sombre sadness of these lands buried beneath the snow, and of the sea congealed with ice.

Nearly all the polar nights are enlivened by more or less brilliant auroras ; but after the middle of January the twilight of midday becomes more sensible ; the aurora announcing the return of the sun increases and mounts towards the zenith, until on the 16th of February a segment of the solar disc like a luminous point, glitters for a moment and is immediately extinguished ; but each midday the segment increases until the whole orb appears above the sea ; this is the end of the long night of winter ; alternations of day and night succeed each other during the sixty-five days before the 21st of April, when commences the long day of four months, during which the sun circulates above the horizon without ever disappearing below it. We will now pass to the physical description of Spitzbergen.

II.—PHYSICAL CONSTITUTION AND GEOLOGY OF SPITZBERGEN.

Spitzbergen—pointed mountains,—such is the name the Dutch navigators bestowed upon it when they discovered it, and indeed from the sea nothing but pointed summits can be seen as far as the eye can reach : these mountains are not of any very great height, their altitudes varying from 500 to 1200 metres (1640 to 3940 feet) ; every where they advance to the edge of the sea, and in general there is but a narrow band of coast line. At the N. and S. extremities of the island, the ground is less broken, the valleys are wider, and the country assumes the aspect of a plain. Three of those profound and ramified bays, called *Fjords* by the Norwegians, cut the western coast of Spitzbergen ; they are, from N. to S. Horn Sound, Bell Sound, Ice Sound, Cross Bay, and King's Bay ; Hamburg Bay, and the Bay de la Madeleine, are shorter and less ramified.

(To be Continued.)

NOTES ON THE ORNITHOLOGY OF NORFOLK.

By T. E. Gunn.

Hobby Hawk. A splendid mature female was killed on the 8th of June, at Witchingham. This species is rarely met with now, the above being the only instance of its occurrence I have noticed for several years past. During the year 1857 or 1858, I cannot now remember which, my friend Mr. Geo. Cooke killed a magnificent adult pair of these birds and also took the nest of four eggs, in a wood at Ketteringham, which is about six miles dis-

tant, (south-west) from Norwich. I saw one of the birds, and part of the eggs in his possession two or three years since. The recently captured specimen mentioned above which I had the pleasure of examining, measured twelve and three quarter inches from beak to tail, ten and a half inches in the wing from carpal joint, the second primary quill feather being the longest. Iris, hazel; irides and cere, lemon yellow; bill, horn colour, darker towards the tip; legs and toes, pale orange; claws, black. The appearance of the body indicated it had been sitting. On opening it I found a cluster of small eggs. Its gizzard was filled with the remains of a skylark, *Alauda arvensis*.

Montague's Harrier. A magnificent pair was killed on the fen-land adjoining the river near Brandon, about the 12th instant; a young bird, one of their offspring, was also obtained at the same time from the nest; they were sent up to Norwich to one of our birdstuffers a day or two afterwards, for preservation. The parent birds were in very good plumage, the young one had hardly moulted its first feathers. Their food appeared to have consisted chiefly of the Water Vole, *Arvicola amphibius*, I found the young bird's crop filled with the flesh, and in the stomachs of the old birds, some pieces of bones and fur, intermixed with a few moderately sized pebbles. They measured as follows :—

	Male.	Female.	Young.
From beak to tail, both inclusive ...	17 inches	17½ inches	13 inches
Wing from carpal joint	17¾ „	14 „	8½ „

Hawfinch, &c. This species has again this season bred in Norfolk. A nest containing three young birds, and an addled egg were taken by a young man, a market-gardener, in his garden at Carleton on the 1st of June; he kept them alive a week or two, until two of them died, then parted with the remaining one, which, with the egg, passed into the possession of Mr. J. Sayer of this city, who still holds them. He has succeeded admirably well in rearing it so far, as it is very tame and lively, and will readily take its food, which consists of egg chopped fine, hemp seed, green peas, and sometimes a little fruit. On the 19th of June, an old male was trapped at Ketteringham; a second example, also a male, was obtained the same day at Cossey. An adult pair of the Great Spotted Woodpecker, *Picus major*, with the nest of four young ones was obtained on the 13th of June at Weeting, near Brandon; the only mark of distinction which appears to exist in the outward appearance of the sexes is the transverse bar of red which the adult male carries at the back of his head, and the total absence of the same in the female.

Greenshank, &c. On the 19th of June, Mr. J. Browne shot a female Greenshank, *Totanus glottis*, on Skoulton Mere. I am lately informed that a pair of Spoonbills, *Platalea leucorodia*, in mature plumage, and a very old example, a male, of the White Stork, *Ciconia alba*, were killed on Breydon Water, Great Yarmouth, during the middle of June last. A Bernicle Goose was shot at Keymerstone on June 6th. On June 14th a splendid adult male Bean Goose, *Anser segetum*, was killed at Beeston Regis, near Cromer.

Norwich, July 28th 1865.

ON *THLASPI ALPESTRE*, &c.

By Jno. Windsor, F.L.S., F.R.C.S., &c.

On the subject of *Thlaspi alpestre*, I have in the *Naturalist* on two former occasions offered a few remarks, and to promote or establish a more correct acquaintance with the forms of this plant, as they occur in our own country, I am now induced to submit briefly the following additions to what has been there stated.

On the 6th, 7th, and 8th of this month (July 1865), accompanied by my relative, Mr. John Needham, I made, after a very long absence from the district, a short excursion to Malham, Gordale, Malham Tarn, and over the hills to moor to Settle.

On this occasion I found nothing in addition, (except an abundance *of Potamogeton prælongus* washed on the margin of Malham Tarn,) to what I had often noticed before, long ago, when I was a resident at Settle; and some of those plants, owing I suppose to the greater number of botanical visitors than formerly, had become rarer or altogether absent. Perhaps the greater exclusiveness in the present day of the possessors of land, in guarding their property by a variety of defences, so different to what prevailed formerly, and so unwelcome to the roaming botanist, may unintentionally have a tendency to preserve some of the old localities of our rarer plants, otherwise likely to be too frequently invaded, and often despoiled of their botanical attractions. In walking over the hills between Malham Tarn and Settle, in its old habitat, an abundance of *Thlaspi alpestre*, or that which in later times has been called (after Jordan) *occitanicum*, was met with, accompanied as it very frequently is, with *Arenaria verna*, and as I had seen the latter at Matlock about a month previously associated with the *Thlaspi* growing there.

Both forms of *Thlaspi*, Mr. J. G. Baker informs me, are found in Teesdale, from which locality he has kindly exchanged specimens with me. I am thus enabled to compare recently collected plants from different places of growth, and to judge, in some degree at least, how far they are essentially distinct, or owe their somewhat different aspects to adventitious circumstances, as the nature of the soil, altitude, exposure, &c.

At Matlock, where I found it abundantly, the plant was growing in a sheltered situation, and attained a stature not generally equalled by that growing on Malham moor, in a more bleak and unsheltered part. There appears to be a nearly similar difference of size in the two forms from Teesdale. How far the difference of locality may operate in modifying their growth and appearance it would be difficult to say, but I think it is not unreasonable to admit its influence. I have a specimen of the Malham plant grown in a garden, which is as tall as the Matlock one, and undoubtedly its size varies considerably in all its localities.

To the supposed differences between the three forms named respectively *Thlaspi alpestre*, *T. occitanicum* and *T. virens*, I have adverted in my previous communications, and from more recent examination and comparison I have little to add now. The fruit bearing *raceme*, is ultimately elongate in all of them, and of an oblong form. The silicle or pouch, varies from oblong obovate to triangular-obcordate in all of them, but the former perhaps predominates in the Teesdale and Matlock *T. alpestre*, the latter in the Malham (and Teesdale), so called, *T. occitanicum*, the pouch in the latter and the intervening notch being also often a little wider, and the interlobular ridge, (an extension of the pedicel) more distinct; this is sometimes equally apparent in both forms. The style is of about the same length in all. The size and colour of the petals is I think the same in all. The root-leaves are obovate, or subspathulate in both and attenuated into the petiole. The stem-leaves in both are sessile and obcordate. The Namur plant seems an intermediate form between the Teesdale or Matlock *alpestre*, and the Malham &c. *occitanicum*. It has the stature and I think *glaucescence* of the former, with the somewhat larger fruit of the latter. Does not this make it probable that the slight differences between them are, in a considerable degree, if not entirely, the result of contingent circumstances. I would however remark that the *glaucous* hue of the foliage is as striking in the Matlock plant, as is its absence in the Malham or Settle form. If the latter be also found at Matlock, it escaped me this year, but as both forms grow in Teesdale, it is possible the same may also occur at the former place. Upon the whole I

am induced to suppose that we have at the most only two instead of three forms of *alpestre*—the one taller and *glaucous* at Matlock, &c., which might appropriately be called *glaucescens*, instead of *virens* as hitherto applied to it. The other of generally lower growth with *green* foliage—the Malham, &c., plant, which might be called *virens*, instead of *occitanicum*. In conclusion I may state, that it would be very satisfactory to me to be informed of the opinions of other botanists on this subject.

Manchester, July, 1865.

LONDON BOTANY, PAST AND PRESENT.

By James Britten.

As the attention of the readers of the *Naturalist* has been for some short time past directed to the various charms presented to their notice in the Birds of Berkshire, the Geology of Gloucestershire, the Botany of Bucks, and the like, I may perhaps be allowed a short space in which to point out to the London Botanist the plants which he may obtain within an easy distance of his city home. The botany of the city itself is, I fear, very scanty, —confined to the hardy Groundsel or Shepherd's Purse, which brave the smoke of the town, with, perhaps occasionally, *Linaria Cymbalaria*, decking a wall in one of those quiet bye streets which one sometimes comes across even in the very heart of London itself. The Arrow-head, which until recently held its ground in the river in the front of the Temple gardens, has at length fallen a victim to the increased traffic of the "silent highway." But in the suburbs—at least in those removed by some short distance from the town itself—there is still much that may be done, as there is much that has passed away. No longer can we, with Gerarde, find the "Small Autumn Jacinth" (*Scilla autumnalis*) upon a "banke by the Thames side between Chelsey and London;" the "Yellow Willow-herbe" (*Lysimachia vulgaris*) which grew "along the medows as you go from London to Battersey neere London," is, like those meadows, a thing of the past; "Hooded Loosestrife" (*Scutellaria galericulata*) has long since disappeared from the "Waters sides in Saint James his Parke"; and Johnson when editing Gerarde's works, had even then to lament that "Wall Penniwort" *Cotyledon umbilicus* "is not now to be found" in its ancient place, "upon Westminster Abbey, over the doore

that leadeth from Chaucers tombe to the the old place." We need not, however, go back as far as the days of Gerarde, to read the melancholy list of "things that were." A list of Battersea plants, published in 1829, contains among others, *Hydrocharis Morsus-ranæ*, *Cicuta virosa*, *Cardamine amara*, and many others, all of which are now exterminated by the ruthless hand of progress; at Forest Hill, too, the collector thirty-five years ago, might obtain among other plants, *Spergula nodosa*, *Hypericum Androsæmum*, *Linum usitatissimum*, *Lathyrus sylvestris*, *Conium maculatum*, *Petroselinum segetum*, *Typha angustifolia*, and *Apera Spica-venti*; but now, alas! "the place thereof knoweth (them) no more."

Leaving the sad contemplation of the past, let us now consider the present, and turn our attention to the plants which may still be collected by the botanist resident in London. If we have lost many of those of the *immediate* neighbourhood of the metropolis, we must not forget that we have now the aid of railways, which enables us to extend our botanical researches without consequent loss of time; besides which it will be found that many plants are still to be seen growing in their old localities. I will enumerate a few of the places over which I have botanised, and the less common species which I have noticed in each of them either this year or last, and which I believe may still be found, premising that my researches have been almost entirely confined to the south and south-western suburbs.

Chelsea and Brompton.—*Erigeron canadensis* is abundant on all waste ground, and on old walls, as in Church-street. *Reseda luteola* grows on waste ground adjoining Oakley-square. The waste ground in Chelsea College last year produced *Hyoscyamus niger*, *Coronopus didyma*, and *Diplotaxis muralis*, (both in abundance), and *Chenopodium hybridum*. *Silene noctiflora* was plentiful here two or three years ago; last year I found it in a similar situation near Eel-brook: *Sagina ciliata* is abundant on the gravel paths, and *Datura Stramonium* frequently appears. On waste ground by the river near Cremorne Gardens *Saponaria officinalis* is well established. Following along the road past Cremorne, we come at length to a large meadow, called Eel-brook; this is the locality where the very rare *Cyperus fuscus* was first discovered. The ground was formerly very marshy, but has recently been drained, and I fear the plant is consequently lost; I have specimens collected there in 1861. *Trifolium fragiferum* is still abundant. On the waste ground and rubbish a little further on, I last year collected *Diplotaxis muralis*, *Coronopus didyma*, and *Mercurialis annua*, all in plenty; also *Datura Stramonium*, *Chenopodium hybridum*, and *Amaranthus Blitum*,

which last, with an exotic ally, *A. retroflexus*, is of frequent occurrence in this neighbourhood. Brompton Cemetery produces *Geranium pyrenaicum* in abundance ; also *Diplotaxis muralis*, *Erigeron canadensis*, and a permanent variety of *Ranunculus bulbosus*, which has white flowers. A wall at the entrance of Walnut-tree Walk, close by, produces *Arenaria serpyllifolia* and *Linaria Cymbalaria*. In the grounds attached to Hollywood School, on the opposite side of the road, the two Yellow Wood-Sorrels, *Oxalis corniculata*, and *O. stricta*, annually occur ; the former was, in 1861, extremely plentiful upon newly turned soil.

Battersea.—Many changes have taken place here since the students of the London Hospitals were wont to make "Battersea Fields" the scene of their botanical studies ; but many plants may still be obtained by the diligent observer. The embankment of the river produced last year several plants of *Coriandrum sativum*, also *Lepidium Draba*, *Nasturtium sylvestre*, *N. terrestre*, *Armoracia amphibia*, *Thlaspi arvense*, *Erysimum cheiranthoides*, *Chenopodium ficifolium*, *Phalaris canariensis*, and *Apera Spica-venti*, all in some abundance. On waste ground, just outside the Park, at the Battersea end, are two or three fine plants of *Diplotaxis tenuifolia*, which is also plentiful as a weed in the beds inside. *D. muralis* and *Erigeron canadensis* abound here ; *Mercurialis annua* is found in several places about the Park. On the banks of a ditch which runs through Battersea Park, two of the "old inhabitants" of the district still hold their ground. These are *Saxifraga granulata* and *Polygonum Bistorta*, both of which have survived the "alterations" and appear likely to do so for many years to come. The famous waste ground near Wandsworth steamboat pier is in Battersea parish ; it still affords abundance of *Lepidium Draba* and *Melilotus parviflora ; Datura Stramonium* was plentiful here last year, and *Trifolium resupinatum* was not quite extinct. *Linaria Cymbalaria* is general on old walls, and *Saxifraga tridactylites* is frequently found thereon.

Wandsworth Common.—On a piece of waste ground close to the entrance to the common, *Torilis nodosa* is abundant ; *Erysimum cheiranthoides* occurred here last year, also *Rumex maritimus* in plenty, and a fine plant of *Hyoscyamus niger*. *Achillea Ptarmica*, *Serratula tinctoria*, *Stachys Betonica*, and *Scutellaria minor* occur in various parts of the common; *Villarsia nymphæoides* and *Stratiotes aloides* were, some few years since, planted in one of the ponds, but these have been exterminated, or "crowded out" by another introduction, *Anacharis Alsinastrum*, the pretty pink flowers of which may now be seen floating on the top of the water. *Sparganium simplex*, *Myosotis*

cæspitosa, and *Bidens cernua*, are to be found about most of the ponds; and *Filago minima* is plentiful on the gravelly parts of the common. In the deep cutting opposite the prison, *Melilotus vulgaris* and *Medicago sativa*, are plentiful and well established. *Veronica Anagallis*, *V. scutellata*, and *Equisetum Telmateia*, grow near the water; and towards the top of the cutting, *Marrubium vulgare* and *Senecio sylvaticus* are abundant, with *Helminthia echioides* in less quantity. On the gravel just outside the cutting *Trigonella ornithopodioides*, *Trifolium subterraneum*, and *Plantago Coronopus* cover the ground, while on the waste ground opposite, are *Koniga maritima*, *Matricaria Parthenium*, and *Chenopodium olidum*. *Amaranthus Blitum* was found last year on waste ground near the prison. The Balham end of the common affords several interesting species; *Radiola millegrana* is very abundant almost close to the palings, with *Carduus pratensis*. *Trifolium hybridum*, *Medicago sativa*, *Melilotus vulgaris*, and *Vicia tetrasperma*, are well established here, with the variety of *T. pratense* known as *β parviflorum*. *Fœniculum vulgare* and *Anthriscus Cerefolium* occur on waste ground, and near the railway, *Reseda lutea*. *Actinocarpus Damasonium* is still to be found in one of the little gravelly streams near the road, opposite the Balham end.

Wimbledon Common is of greater extent than the preceding, and the botanist may here enjoy sweet country air, and a profitable afternoon's botanising. At the entrance to Putney Heath, *Barbarea præcox*, and *Marrubium vulgare* may be found, the former well established. Scattered over the common are *Cuscuta Epithymum* (upon the Heath and Thyme in several places), *Jasione montana*, *Filago minima*, *Orobus tuberosus*, *Scutellaria minor*, *Carduus pratensis*, *Serratula tinctoria*, *Solidago Virgaurea*, and *Stachys Betonica*. Near the grounds of the Chelsea Waterworks, *Epilobium angustifolium* occurs, evidently an escape from cultivation. On the almost bare ground near the Windmill, I found, in the spring, *Mœnchia erecta*, *Myosotis collina*, and *M. versicolor*; and the adjoining ravine near the butts still furnishes *Lotus major*, *Melampyrum pratense*, and *Menyanthes trifoliata*. At the end of the butts furthest from the Windmill, I find *Lysimachia nemorum*, *Calamintha Clinopodium*, *Erythræa Centaurium*, and *Teucrium Scorodonia*. At some little distance beyond the Windmill, on the bank surrounding a house, *Lactuca muralis* is found sparingly; this, near London, is a scarce plant; and, further on still, upon waste ground, *Marrubium vulgare* and *Datura Stramonium* are abundant. *Alisma ranunculoides* occurs by an adjoining pond. On the part of the Common nearest Roehampton are *Trifolium striatum*, *T. subterraneum*, and *Trigonella ornithopodiodes*, all in plenty,

also *Teesdalia nudicaulis*, *Erodium cicutarium*, *Scutellaria minor* and *Plantago Coronopus*. From the foregoing it will be seen that the London botanist has much reason to be thankful that Earl Spencer's disinterested (?) proposal has not been carried into effect.

Barnes Common.—On the end nearest Putney, *Centaurea Calcitrapa* is very abundant, *Acorus Calamus* is plentiful in ponds below the Cemetery, and *Filago minima*, *Stachys Betonica*, *Sedum acre*, *&c.*, occur on several parts of the Common. *Alisma ranunculoides* is pretty frequent about a small pond and in marshy ground across the railway bridge, nearest but one to the station in going from Putney. *Verbascum nigrum*, and *Diplotaxis muralis* grow on waste ground by Hammersmith Bridge; and *Thalictrum flavum* by a ditch by the river in the same place ; *Petasites vulgaris* is abundant by the river.

New Cross.—The railway banks here will be found to produce several interesting species. *Lepidium Draba* grows in profusion both by the railway and in adjoining fields and waste ground ; and the latter situation also furnishes *Sinapis nigra*, *Erysimum cheiranthoides* (sparingly) *Reseda luteola*, *Helminthia echioides* and *Chenopodium ficifolium* (both in plenty), and *Bromus secalinus*. The following species were found on the railway banks : *Melilotus officinalis*, *M. vulgaris*, *Vicia hirsuta*, *V. Cracca*, *Trifolium medium*, *Medicago sativa*, *Epilobium angustifolium*, and *Erythræa Centaurium*. *Potamogeton crispus* was observed in a pond close by.

Lower Sydenham.—This locality, though perhaps somewhat further from the metropolis than the preceding ones, I have introduced here on account of a rare plant which it produces—*Impatiens fulva*. As this species is very abundant along the banks of the little river Ravensbourne near this place, and there is consequently no fear of its extermination, I copy the following description of the way to the locality from my notes of last year, for the benefit of future visitors. "The best way is to pursue the road direct from the L. S. Station through Lower Sydenham to Perry Hill, and turn down the lane just before reaching the 'Two Brewers,' follow this until you arrive at a running ditch, which follow until you come to a gate—not a turnstile—which pass through and cross the railway, by the side of which is *Lepidium campestre*. Turn across the meadow to the left, which brings you to the stream : here and in the neighbouring ditches *I. fulva* grows in large masses." *Œnothera biennis* is well established on rough ground in this meadow, and *Rhinanthus Crista-galli* occurs sparingly. *Typha latifolia* and *Veronica Anagallis* grow near the water.

I am sorry that I have not been able to render this paper more complete by furnishing lists of the plants found to the North of London; but I am not without hope that this may be done by some botanist more competent than myself. Until then, however, the above may stand as a contribution to the 'London Flora' of the present day.

High Wycombe, August 7th, 1865.

Reports of Societies.

Richmond and North Riding Naturalists' Field Club.—On Tuesday, July 25th, the members of this club held a Field Meeting at Croft. Leaving Richmond by the 12.30 p.m. train they arrived at Croft in about half-an-hour, when, shortly after leaving the train, they proceeded through the village in the direction of Hell Kettles, (the local name given to two large ponds of sulphurous water). Arrived at the first of these which is the one most strongly impregnated with sulphur and is several feet in depth a great many botanical specimens were found, amongst which may be mentioned: *Cladium Mariscus, Juncus obtusiflorus, Myriophyllum verticillatum, Potamogeton lucens*, and *P. pectinatus, Ranunculus sceleratus, Eupatorium Cannabinum, Utricularia vulgaris, Alisma plantago, Triglochin palustre, Œnanthe fistulosa, Solanum Dulcamara, Sium angustifolium, Populus canescens, Lemna trisulca, Chara aspera.* Along the course of the river Skerne to its junction with the Tees were found *Sparganium simplex*, and *S. ramosum, Scutellaria galericulata, Stachys palustris, Nuphar lutea, Scirpus sylvaticus* and *S. lacustris*—plants of this growing very luxuriantly, being from eight to nine feet in height. On the road back to Croft were found specimens of *Artemisia vulgaris, Rosa Sabini var. Doniana, Onopordum Acanthium, Alchemilla arvensis, Bryonia dioica.* The party after returning to Croft and partaking of refreshment at the Spa Hotel set out for the woods near Halnaby Hall, a distance of a mile and a half. In the ditches in that neighbourhood were found *Hottonia palustris, Ranunculus Lingua, Stellaria glauca, Comarum palustre, Salix pentandra S. fusca, &c.* After strolling about Croft and seeing the principal places of interest in the neighbourhood the party brought their third excursion to a close and arrived in Richmond at about half-past nine o'clock.—J. Aspdin, Sec.

Reviews.

Easy Guide to the British Hepaticæ.—(Hardwicke's Science Gossip). By M. C. Cooke. (London, Robert Hardwicke, 1865.)

Of all the divisions of British Cryptogamic Botany, the Hepaticæ alone have for many years in vain required elucidation and critical revision. The Mosses, Lichens, Algæ, and Fungi, have each in turn received the attention of botanists, and on each we are now furnished with handbooks and descriptions of species equal to the requirements of the age, and including most of the recent discoveries. The Hepaticæ, hitherto apparently neglected, have at last found an elucidator, who has furnished us with a short and easy description of each species, illustrated with an outline figure, and arranged according to the latest continental nomenclature. We say, hitherto *apparently neglected* Hepaticæ. This requires some qualification,—what we mean is that whilst many acute botanists have been working hard, both in the

field and the cabinet, in collecting and examining this interesting class of plants, none have been found willing to undertake the publication of a handbook of the British species, in our language, embodying the results of their labours. The old genus of Linneus—*Jungermannia*—is now found to be capable of sub-division into a number of well marked genera, and the old generic term is now used for a sub-order, thus rendering the discrimination of these forms much more easy than under the old nomenclature. In presenting this "illustrated catalogue" as he modestly styles it, to the public, Mr. Cooke claims to be no more than a pioneer to a larger and more elaborate work, which is now being prepared by Dr. B. Carrington, than whom, we know of no one more competent to the task. Nevertheless Mr. Cooke's pamphlet will be of no small value for the student who is inclined to investigate the forms and distribution of the Hepaticæ in Britain, and we heartily commend it to the attention of our readers. We could almost have wished that a short diagnosis of each *genus* had been included, but in the compass within which it is circumscribed this would appear to be an impossibility, and we must await the appearance of the larger work for this desideratum. Although not critical, nor including any synonyms, the specific diagnoses are sufficiently clear with the aid of the diagrams, to render their descrimination a matter comparatively easy, and we must add that the extremely small price at which it is issued will insure its being in the possession of every one interested in the study of the order.

Whilst on the subject of Cryptogamic Botany, we may be permitted to call attention to the handbook of the Microscopic Fungi recently published by Mr. Cooke, under the title of "Rust, Smut, Brand and Mould." There is perhaps no more interesting class of organisms than those minute *Fungi*, which under various names infest our crops, and may be found in greater or less abundance upon almost every plant. They are beautiful objects under the microscope, and for the botanical microscopist there is yet a great amount of useful work to be done amongst them.

Observations.

Occurrence of Chœrocampa celerio, at Perth.—On Monday last, I was fortunate enough to capture a very fine (female) specimen of *Chœrocampa celerio;* this is the second specimen that has been found in this neighbourhood. I also, about a fortnight ago, picked up a few hundreds of the larvæ of *Euchelia Jacobææ* at Broughty Ferry in Forfarshire. As both species are rare so far north I think the captures are worth recording.—JOHN STEWART.

P.S. The larvæ of *Vanessa Cardui* have been found here this season in abundance. J. S.

Larvæ of Acherontia Atropos.—I have in my possession some larvæ of *Acherontia Atropos*, Linn. collected by my friend Mr. J. B. Proctor, from the tops of *Solanum tuberosum*, at Boston Spa, Clifford Moor, near Tadcaster, on Wednesday, 26th of July ; the larva measures four and a half inches in length by five-eighths of an inch in diameter, and is in the highest degree beautiful, its colour being of a fine bright yellow, and the sides marked by a row of elegant stripes, or bands, of a vivid violet and sky blue colour; these stripes or bands meet on the top of the back of each segment in an angle, and are alternated with black spots ; the horn projects over in the manner of a curved yellow rough tail; the larvæ are nearly full fed.—J. BLACKBURN, Leeds. July 29th, 1865.

Potamogeten nitens, Web : *in Perthshire.*—Mr. John Sim has sent us specimens of this plant, which the recent lowness of the water has enabled him to reach. He found it growing in the R. Tay, near Perth, in very rapid and deep water ; *P. crispus* and *P. perfoliatus* being associated with it. With respect to *P. nitens*, Prof. Babington states in "Seemann's Journal of Botany,"

(No 32. p. 259) :—"The specimens closely resemble the *P. lanceolatus* of Reichenbach's Icones vii t. 31, which is certainly not the *P. lanceolatus* of Smith and seems almost equally certainly, a state of *P. nitens*. l. c. t. 34."—(*Eds. Nat.*)

News.

Singular Death of a Sea-Gull.—On Sunday last, Mr. Wales, butler to Mr. Dalrymple, Langlee, Galashiels, observed a white object hanging on a paling, and on approaching he found it to be a dead seagull. The bird had been on a fishing adventure, and had come across a fixed bait with hooks attached. One of the hooks had fastened in its tongue, and in endeavouring to get free, it carried away about two feet of gut and another hook. In its flight across the fields, the flying hook stuck fast in the paling, and the poor bird, unable to break loose a second time hung till it died. —*Scotsman.*

Sale of Rare Eggs.— Mr. Stevens sold a few days since, at his rooms in King-street, a collection of eggs and skins of very rare birds. Included in the former were four eggs of the Great Auk (now extinct.)(?) The prices fetched were as under, and go far to show how keen is the taste for all relating to natural history : Egg of Great Auk, £29 ; ditto, £33 ; ditto, £31 10s. ; ditto, £29—total £122 10s. One egg of the Casarca, or Ruddy Shieldrake, fetched £1 16s., which is rather remarkable as specimens of the bird are, comparatively speaking, in all ornithological collections. —*Gardener's Chronicle.*

Capture of a Gigantic Shark at Ilfracombe.—A gentleman, named Mr. G. P. O. Richardson writes to the *Times* on Monday from Ilfracombe to announce the capture of a very large specimen of the hammer-headed shark *Zygnœa malleus*. He says : "About one p.m. yesterday, a large object was observed floundering among the rocks near the ladies' bathing cove by the boatmen on the quay-head. With great difficulty and some risk it was secured by ropes, and triumphantly towed into Ilfracombe harbour; it was then placed on a cart and drawn through the streets. For a small amount I obtained the carcass, and had it placed in the small garden behind our house. On measurement it was found to be 13ft. 7 in. in length, 7ft. 2in. in girth behind the pectoral fins, 3ft. 3in. between the orbits of the eyes, which were nearly covered by crustacean parasites. On opening the animal the remains of two Thornbacks and a Bass were found, together with a number of intestinal worms of enormous size. There is only one recorded appearance of this remarkable fish on the British coast, at Caiston, near Yarmouth, in the year 1825. Would any of your readers suggest the best means of preserving this valuable specimen for our magnificent national collection."

Capture of a new British Malthodes.—I caught two specimens of a *Malthodes* at Gibside in July last year, which I have since determined to be *Malthodes mysticus*, Kiesenw., Thomson, Skandinaviens *Coleoptera*, Vol. VI. 199, 3 ; and which is, I believe, new to the British Fauna. It has much the look of *M. dispar ;* but differs in being darker coloured, and in having the thorax and elytra proportionately shorter. The sub-quadrate thorax, also, is distinctly margined, and the ventral segments in the male are very different. One of the specimens has dark-coloured unspotted elytra, whilst the other has the usual yellow tips.—Thos. Jno. Bold, Long Benton, Newcastle-on-Tyne, *June* 21, 1865.—*Entomologist's Monthly Magazine.*

Notes and Queries.

Corn Blight at Malton.—Will any of our correspondents in the neighbourhood of Malton, be kind enough to send us a few examples of the straw and ears of the blighted crops in their neighbourhood.—*Eds. Nat.*

Original Articles.

A SURREY TRIP.

By W. R. Tate.

As one or two papers on local rambles of an interesting character have lately appeared in the *Naturalist* and as all such papers are contributions to the Geography of our Science, I am induced to forward a few notes on a pleasant trip I lately made, in company with my friend Mr. Stacey, to the neighbourhood of Wisley, in Surrey.

We left Vauxhall station on Saturday morning, July 29th, and arrived at Walton about 8 o'clock, having noticed on our journey that the harvest was already general. The first thing that strikes one in this part of Surrey is the peculiar and very refreshing smell of the numerous fir plantations. Almost immediately on leaving the station we found a few dewberries already ripe in the hedges. A few yards further on we perceived a squirrel playing among the fir trees; often when I have surprised one feeding on the ground it has merely run behind a tree, thinking that as it could not see me, I did not know where it was; I have twice all but caught one by throwing my hand round the tree. The next noticeable thing we came to was a large sand pit, in which were myriads of sand martins; there were fewer than usual at Weybridge in May, but I never before saw such a swarm of these pretty little hirundines as were flying in and out of their holes in this pit. We crossed a common on which were some gravel and sandpits, on the sides of which we hoped to find *Lacerta agilis*, but were disappointed. Passing along between numerous plantations, with occasional corn fields interspersed, we at length arrived at the beautiful heath by Pain's Hill, where we heard the Golden Oriole. I know its voice, having once started one between Oakshade and Claremont, in an unenclosed plantation. A few furlongs further, and we were at Wisley Heath. This is a typical Surrey heath, and a spot more delightful cannot be conceived. The ground at this season is covered with heather blossom of all hues, from magenta to white; larch, and spruce fir trees are dotted about; numberless bees are gathering honey from the heath and thymes; *Zootoca vivipara* * is now and then to be seen darting about the

* It is worthy of notice, that these reptiles, after eating, lick their lips like cats. Does this indicate that they possess the sense of taste in a high degree?

ground, and the wood pigeons keep cooing in the adjoining woods. Here the peasant can turn out his cattle and obtain fuel for nothing, and it is on these "common" lands, for the most part wild heathy moorlands, that one sees Nature's beauties in the greatest perfection. The spade used for paring the heath for fuel has a flat, anchor-shaped ace, and is pushed forward by the chest. Making our way by the side of a plantation of Scotch firs, we arrive at one of the old semaphore telegraphs between London and Portsmouth. This is now used as a cottage, and a capital one it makes. From the top the view is very fine embracing Epsom Downs, the Hog's back, Windsor Castle, the hills about High Wycombe, Harrow Hill and the smoke of London. There is near an acre of garden and orchard attached, which is very well kept by a labourer named Smith, who lives here; the appearance of the cottage and garden, with its fowls and beehives, surrounded on two sides by fir plantations and on the other two by heath, is quite enchanting. Here Mrs. Smith, as she has often done before, gave us a hospitable breakfast, which after our early walk we eat with great relish, and then set out in search of reptiles, which were the chief objects of our search: but we did not find so many as in the spring; we found no vipers; they are certainly not so numerous as snakes, when I do find them, it is usually where furze has been cut, and it is hard to tell them from the furze stalks lying about; they evidently choose these places to sun themselves in because of the difficulty of being distinguished in them. We wanted much to catch some Natterjack toads, but the drought kept them all in their holes except a few, quite young ones; I may here correct a mistake I made in the *Naturalist* of April 15th: speaking of the common toad and natterjack, I there said the "natterjack is much the more diurnal of the two." I have since found that this is not the case, and that their setting off running when surprised by day is because they are then dazzled and confused; in the night they squat flat on the ground to escape observation; after luncheon at a roadside tavern, on the Portsmouth road, which runs across the heath, we had a bath in the Wey river, not far off. *Impatiens fulva*, and *Epilobium angustifolium** both grow on the banks, and otters are occasionally found in this part of the river. We returned to the heath across a corner of Kepley Green, of sixty-eight acres, the largest green in England with Dunsborough House, the picturesque seat of Major Enslow facing it; thence to Ockham Mill, over the foot bridge in the lane,

* I lately noticed this plant in extraordinary abundance on both sides of the road, called Green Lanes, north of Wood Green, Middlesex, and at Cook's Hole, north of Enfield, less abundantly.

a painting of which by Mr. Hulme was exhibited in the Royal Academy and engraved in the " Illustrated London News" last year. On the heath I saw a slowworm poking its head out of its hole, but on seeing us, it darted up it—the mouth of the hole was at the bottom and the end at the top of a bank,—and although I quickly grubbed up a great part of the hole, I could not reach it ; they certainly are not *slow*-worms when in their holes. We noticed a great deal of the sundew *Drosera rotundifolia*, and white dwarf rattle as we crossed the heath ; at dusk we again rambled about hoping to find natterjacks, but caught hardly any ; they come out most after wet days ; it is curious to notice how alike are the voices of the natterjacks and the nightjar, both of which may often be heard on the heath at night.

Next morning the corn-crake made itself heard nearly under our window, it must have been in a low meadow by the mole river, or in the garden. At Ockham we noticed the only innovation for its own sake that has found its way into this peaceful district ; viz : that Lord Lovelace has in two places substituted for the old white guide posts, so easily read at night, the names of the places which the respective roads lead to, merely cut in the bricks of adjoining walls, which is not at all conspicuous by day, and at night is useless ; we got back to the heath, at a pretty hamlet called by the inappropriate name of " Hell Corner ;" on our way to the semaphore we noticed several furze chats *Saxicola rubicola.* In the evening in company with Mr. Smith, we visited a large pond known as the " Hut Pond ;" whilst standing there a flock of birds flew across it, dipping like swallows as they flew, and so frequently as to resemble stones thrown " duck and drake" fashion. On their alighting on the sandy margin, we saw that they had rather long legs, and were constantly wading into the water, were of a brown colour, and kept up an incessant piping, I have no doubt they were sandpipers. The next day I noticed twenty-five of them flying through the rain towards the lake. Terns occasionally visit this piece of water ; Mr. Gold the landlord of the " Hut" tavern, has three stuffed specimens, all shot over it. On our way to Downside at night we heard the screech owl *Strix Stridula* : and just before dusk, we saw flying round a dried up pond three noctules, *Vepertilio noctula*, in company with a few swifts, swallows, and lapwings,—a singular medley.

On Monday we went first to a spot called Bushy Thicket in the direction of the Horsley's ; here we found a young snake, little thicker than a quill, engaged in eating a half-grown toad, *B. vulgaris* ; we took the snake, and I have it now in a box with other reptiles ; we afterwards caught a rather large one in a neighbouring wood, so that we had three to bring home, as we

had caught one—a handsome specimen with a new skin—on our way to the river on Saturday ; we next disturbed a nightjar, which flew into an oak close by, shewing us its peculiar way of sitting lengthways on a branch. On calling at a cottage hard by, whose inmates—a man, wife, and little boy,—we knew, we found they were out, and soon after came across them engaged in reaping, *alone*, a six acre field of wheat. There is a great scarcity of hands here for harvesting. On one side of the corn-field is a wood, and several of its feathered inhabitants—tomtits, long-tailed tits, etc. were engaged in eating a little of the corn, which who can grudge them as wages for keeping down noxious insects ? It was funny to notice the long-tailed tit hanging on a stalk, and picking the ear ; while I was looking another way, Stacy saw eight or ten jays fly into the wood; I have seen near here as many as twenty together. Our road hence lay through the wood, and we noticed how the birds had deserted the end of it remote from the corn-fields. Cup-moss was abundant on the banks, and the show of blackberries very large ; we also found some bright red *fungi*, which are common here; passing May Green and Martyr's Green, the cottagers round each of which fatten a great many geese, we crossed the slades or low parts of Wisley heath, and in a pheasant preserve saw figures of men with guns in their hands, which the gamekeeper told me are to frighten away foxes. We returned by train from Weybridge station, bringing back with us some Hart's Tongue—there called Seaweed-Ferns, which Smith had kindly dug for us in one of the few localities where they grow in the neighbourhood.

4, *Grove Place, Denmark Hill, London.*

A CATALOGUE OF THE BIRDS OF SHETLAND.

By Henry L. Saxby, M.D.

Although the accounts of the Ornithology of Shetland which have been published during the last forty years, are not only numerous, but, as a rule, accurate, circumstances have lately occurred, leading me to the belief that an entirely new list of the species which have hitherto been observed in these islands, will not be unacceptable to the readers of the *Naturalist*, more especially to those who have lately applied in vain for specimens which are seldom or never observed in this locality, under the impression that they

were of common occurrence. With the view, therefore, of preventing a considerable amount of disappointment upon the part of my brother collectors, and also in the hope of furnishing some reliable information upon a subject which is still comparatively but little understood, I have obtained permission from the Rev. F. O. Morris to revise for these pages a catalogue compiled by me, for his use, several years ago ; but which in consequence of recent investigations, has become almost useless in its original form.

Ornithologists visiting the Shetland Islands for the first time, very naturally expect to meet with rarities at almost every step, and yet, they almost invariably return sadly disappointed. Most of the British Falconidæ are known to occur here, and we boast of two or three noble representatives of the Strigidæ, yet, if the collector, after a month's tour, find the merlin, the kestrel, the hen-harrier, and perhaps the short-eared owl among his spoils, he may consider himself more fortunate than the generality of visitors. Again, the list of Insessorial birds includes nearly sixty species, but less than a dozen are commonly met with, and of these the raven, the hooded crow, and the twite alone cannot readily be procured elsewhere. Of the Rasorial birds we have four species, only one of which, the rock dove, is common, and in the list of Grallatores we find a remarkably small number of indigenous species. But it is among the Natatores that the Ornithologists' hopes are centred, for Shetland is popularly supposed to be the stronghold of ducks, geese, and wild fowl of every description. Now, it must be confessed, that although the cliffs are abundantly stocked with nearly every species of "rock-bird" which is found in other parts of the British Islands, no geese, and only a very small number of ducks remain here to breed ; indeed the greater number of the Anatidæ are never common, even in winter. This may at first sight appear somewhat unaccountable, for not only are lochs, pools, and marshes abundant, but the whole coast is so indented with sheltered bays and deep inlets—many of them three miles in length, that it would be difficult to find any one spot more than two miles distant from salt water. However, I fear we need not search far for the solution of the mystery. On looking over the entire list I find that almost every addition has occurred between the months of April and October, or in other words, during that portion of the year most favourable for the pursuit of *out-of-door* ornithology. Now, in these islands the duration of day-light at mid-winter, scarcely exceeds four hours, and moreover, travelling either by land or by water is often quite impracticable, therefore it is not to be wondered at if the haunts of the wild fowl are left comparatively undisturbed during that very

period, when, under other circumstances, the collector would be sure to reap a rich harvest. It was only last year that I visited Uyra, a small island less than half-a-mile distant from Unst, but instead of being able to return the same night, I was detained there for six days, a sudden rise in the wind having rendered the Sound impassable. It will scarcely therefore be a matter of surprise if some greater enthusiast than myself, or even perhaps some one with more leisure than is at my own command, should hereafter not only add numerous Anatidæ to the list, but also mention as of common occurrence many of those species which I have marked as rare, and this will almost certainly occur in the south of Shetland, my own observations having been chiefly confined to the extreme north. The paucity of resident Insessorial birds is easily accounted for by the total absence of trees and shrubs, except in two or three small gardens, and also in a valley near Rona's Hill, where a very few extremely small specimens of the mountain ash may still be observed. With these exceptions I am safe in the assertion that heather is the largest native wood! There can be no doubt that since Dr. Edmondston introduced trees into the island of Unst, many birds which used formerly to pass over without checking their flight, now pause upon their way for awhile, and this I have most particularly observed with regard to the blackbird, the brambling, the chaffinch, the crossbill, and several other species. The absence of the red grouse from the list may surprise those who have enjoyed a season in Orkney, where it abounds, and it is difficult to say why the experiment of introducing it has not been attempted in Mainland and Yell, where the heather is tall enough to afford shelter. However, the propriety of making the attempt is now being so seriously discussed, that I should not be astonished if before very long the jail at Lerwick were to be enlarged, and Shetland were at length able to rear its own "ticket-of-leave men."

While endeavouring to make this catalogue as brief as possible, I have at the same time arranged it in its most useful form by availing myself of the excellent method proposed by Mr. Newman in his appendix to the "Letters of Rusticus," a method, which, if more generally adopted, would considerably lessen the labours of the enquirer, in attempting to gain a knowledge of the ornithology of any particular locality. Accordingly I have arranged the species under five heads, viz —Resident Natives, Migrant Natives, Winter Visitors, Passing Visitors, and Occasional Visitors.

I. RESIDENT NATIVES.

Of these there are thirty-three species all of which not only breed here, but remain throughout the year.

Whitetailed Eagle, *Falco albicilla*, (Erne.) Formerly abundant, and still breeding in Yell, Fetlar, and Noss.

Peregrine Falcon, *Falco peregrinus*, (Stock-hawk.) Breeds in several of the high sea cliffs. Although it hatches regularly and its haunts are seldom disturbed, the number of individuals now observed is no larger than it was many years ago. Extremely wary and difficult to obtain.

Merlin, *Falco æsalon*, (Maalin, Blue-hawk, Blue-back hawk.) Far more abundant than the Peregrine. Less numerous in winter than in spring. The eggs are seldom obtained.

Kestrel, *Falco tinnunculus*. Never abundant. Breeds in several of the sea cliffs.

Sparrowhawk, *Falco nisus*. By no means common at any time, but so far as I can ascertain a few pairs breed regularly in the sea cliffs, and sometimes among high rocks inland.

Hen Harrier, *Falco cyaneus*. Breeds in some parts of Shetland, but very sparingly.

Rock Pipit, *Anthus obscurus*, (Tang-sparrow, Teetick.) Abundant, breeds upon all parts of the coast.

Sky Lark, *Alauda arvensis*, (Laverock, Lady hen.) Very common in summer, but in winter more or less migratory, according to the severity of the season.

Common Bunting, *Emberiza miliaria*. Breeds here, but numerous flocks arrive in winter.

House Sparrow, *Fringilla domestica*. Common everywhere.

Twite, *Fringilla montium*, (Lintie.) Abundant and very mischievous. Young broods gather into flocks as soon as fledged ; these flocks increase in size as winter approaches, only dispersing when the breeding season has fairly commenced. More than once it has been positively stated that the common linnet, *F. cannabina*, breeds here, but after the most careful enquiry I am unable to mention one single instance in which that species has been seen in any part of these islands.

Starling, *Sturnus vulgaris*, (Stirlin.) Common. Although mercilessly shot down by all carriers of guns, the number is decidedly on the increase. It imitates so exactly the notes of the Ringed Plover, Oystercatcher, Redshank, Whimbrel, and many other species, that I have long since given up my former practice of recording the arrival of a migratory bird after merely hearing its supposed note.

Raven, *Corvus corax*, (Corbie.) One of the earliest breeders, sometimes

beginning to build a nest, or to repair an old one, as early as the month of February.

Hooded Crow, *Corvus cornix*, (Craa. Hoodie craa.) Very numerous.

Wren, *Troglodytes europæus*, (Robin redbreast.) In steadily increasing numbers. The usual situation for the nest is beneath the overhanging turf at the edge of a low cliff. The eggs being of no value to the Shetlanders, are rarely sought after.

Rock Dove, *Columba livia*, (Doo. Wild pigeon.) Breeds abundantly in most of the sea caves, but, owing to the inaccessibility of the ledges upon which the nests are placed, the eggs are but seldom obtained.

Golden Plover, *Charadrius pluvialis*, (Plover.) Very common. In Autumn gathers into large flocks, joining for awhile with others as large, which visit us on their way southwards. Those which remain during the Winter, resort to the sea-shore in hard weather.

Ringed Plover, *Charadrius hiaticula*, (Sandy-loo.) Common upon almost every part of the coast, breeding abundantly both on the sea-beach and far inland, upon low grounds, sometimes also upon stony hills. Collects into flocks after the close of the breeding season and retires to the shore, dispersing and returning to the breeding grounds early in March.

Curlew, *Numenius arquata*, (Whaap, Stock-whaap.) Abundant. Remains in families throughout the winter ; these collect into flocks in spring, and pairing commences soon afterwards. The eggs are not often found, but this may be accounted for by the retired nature of the situations in which they are deposited.

Snipe, *Scolopax gallinago*, (Snippack, Gowk or gook.) Numerous in all seasons. Breeds in almost every suitable locality.

Dunlin, *Tringa variabilis*, (Plover page.) Tolerably plentiful in the breeding season, collecting into flocks in winter, but seldom to any great extent.

Wild Duck, *Anas boschas*, (Stock duck.) Considerable numbers visit us in autumn and many remain to breed.

Teal, *Anas crecca*. Seldom numerous, but a few breed here.

Eider Duck, *Anas mollissima*, (Dunter, Dunter-duck.) Not so numerous as formerly. Sometimes observed in flocks of considerable size in the winter months ; pairs in March.

Redbreasted Merganser, *Mergus serrator*, (Herald duck.) Breeds on most parts of the coast.

Red-throated Diver, *Colymbus septentrionalis* (Rain-goose. So called on

account of its peculiar croaking note being heard chiefly in wet weather.) Once very common, but now rapidly decreasing in numbers.

Black Guillemot, *Uria grylle*, (Tystic.) Common upon all our coasts, and still breeding in considerable numbers.

Cormorant, *Carbo cormoranus*, (Loring, Great or large Scarf.) Generally distributed around the coast in winter, but very local during the breeding season.

Shag, *Carbo cristatus*, (Scarf, Little Scarf.) Far more numerous than the preceding species. Very large flocks sometimes collect in sheltered bays when fish are numerous.

Black-headed Gull, *Larus ridibundus*, (Blackheaded maa.) Most numerous in winter, but still breeds frequently in some parts.

Common Gull, *Larus canus*, (Tannia maa.) Less numerous than formerly.

Herring Gull, *Larus argentatus*, (Maa, White or blue maa.) By far the most common of its species.

Great Blackbacked Gull, *Larus marinus*, (Baagie.) Somewhat local, but still breeding rather plentifully upon those parts of the coast which suit its habits.

NOTES ON NORFOLK ENTOMOLOGY—LEPIDOPTERA.

By T. E. Gunn.

Part III.

Since the publication of my former notes on Norfolk Entomology, in the first volume of the *Naturalist*, the occurrence of several other species has passed within my notice, and with the kind assistance and much valuable information I have received from several of my entomological friends, whose names I shall not omit to mention in the course of my observations, I am thus enabled to offer information on the entomology of Norfolk in general, it having been my intention at the first outset to confine these notes chiefly to my own personal observations.

Diurni.

Colias Edusa. This species, now rarely met with, formerly occurred pretty abundantly in this neighbourhood; my friend Mr. H. Summons, says he can recollect the time when he has taken upwards of twenty examples in an hour or two.

Argynnis Paphia. Uncommon, local. Horsford, Taverham, and Ringland.

A. Adippe. Local. Mr. J. Perry observed this species to be pretty plentiful at Horsford, on the 17th of July last.

A. Euphrosyne. Common, local. Horsford and St. Faiths.

A. Selene. Common and local. Horsford and Hoveton, St. John. This and the preceding appear to be unusually abundant this season in the former locality, Mr. J. Lumb having taken in the course of about two hours, upwards of forty specimens.

Melitæa Artemis. Local. Horning, Mrs. Sayer.

Satyrus Semele. Common and local. Horsford.

Lycæna agestis. Not uncommon.

Hesperia comma. Not uncommon but local. Horsford, Horstead, &c.

NOCTURNI.

Chœrocampa porcellus. Generally distributed in the fens.

Macroglossa stellatarum. Widely distributed, and is taken quite plentifully this season.

Sesia bembeciformis. Very rare. Mr. I. S. Sayers caught one example at Neatishead, in 1862.

Macrogaster arundinis. Local, rare. Neatishead.

Zeuzera æsculi. Uncommon. Widely distributed.

Limacodes testudo. Rare. One specimen at Neatishead, in 1863, Mr. I. S. Sayer.

Zygæna trifolii. Local. Numerous at Neatishead in 1862.

Lithosia muscerda. Local. Numerous at Irstead, in 1862, Mr. Sayer. It has also been taken sparingly at Brundall.

L. helveola. Uncommon, local.

L. griseola. Rare, local. Fens.

L. stramineola. Rare.

Eulepia grammica. Rare. Two specimens at Irstead in 1863. Mr. Sayer.

Euthemonia russula. Local. Pretty common at Horsford.

Arctia fuliginosa. Not uncommon and generally distributed.

Liparis auriflua. Having lately reared the imago of this species from larvæ taken in May last, I placed some of the females as soon as they emerged from the pupa-cases in a compartment in my breeding-cage by themselves, and in two or three days they commenced laying their eggs, covering them carefully with that yellowish brown substance, so well known to entomologists from the curious and irritable properties it possesses; in the course of about a fortnight, the minute caterpillars made

their appearance, and soon commenced feeding vigorously on currant leaves, &c., which I had placed in readiness for them. This circumstance proves that the union of the sexes is not at all times necessary for the production of the young. I reared larvæ of *Chelonia caja*, and *Arctia subricipeda*, in a similar manner, last season, but omitted to mention the circumstance, which is I believe not at all an unusual event among some species particularly the more common. I mentioned the matter to my friend Mr. J. Perry, who concurs with me in that respect, he himself having met with a similar occurrence, in two or three instances.

L. salicis. I have bred a quantity of very fine insects, from larvæ taken at Haddiscoe, this season.

L. dispar. Uncommon, local. Earlham.

Eriogaster lanestris. The larvæ of this species have occurred quite abundantly this season, in various localities; four nests were taken near the railway station at Hethersett, but were destroyed with the exception of one, which a friend saved for me; it contained about two hundred larvæ nealy full grown. It has also been taken pretty numerously at Horsford by Messrs. Summons and Sayer, during a recent excursion in that district.

Bombyx rubi. Not uncommon and generally distributed.

Norwich, August 4th, 1865.

MATERIALS FOR A FLORA OF WAKEFIELD AND ITS NEIGHBOURHOOD.

By T. W. Gissing.

(Continued from page 97.

Œ. Phellandrium, Spr. Fine-leaved Water Dropwort. B. July—September. Warmfield, New Miller Dam, &c

Æthusa. *Linn.* Fool's Parsley.

Æ. Cynapium, L. Common Fool's Parsley. A. July—September. Common.

Angelica. *Linn.* Angelica.

A. sylvestris, L. Wild Angelica. P. July—September. Common.

Heracleum. *Linn.* Cow-Parsnep.

H. Sphondylium, L. Hog-weed or Cow-Parsnep. B. June—August. Common. The variety *angustifolium* is sometimes found.

DAUCUS. *Linn.* Carrot.

D. Carota, L. Wild Carrot. B. June—August. Frequent.

TORILIS. *Adans.* Hedge Parsley.

T. infesta, Spr. Spreading Hedge Parsley. A. July—September. Frequent in cornfields.

T. anthriscus, Gaertn. Upright Hedge Parsley. A. July—September. Frequent.

T. nodosa, Gaertn. Knotted Hedge Parsley. A. May—July. Oakenshaw, Pontefract, &c.

SCANDIX. *Linn.* Shepherd's Needle.

S. Pecten-Veneris, L. Shepherd's Needle, or Venus' Comb. A. June—September. Common.

CHÆROPHYLLUM. *Linn.* Chervil.

C. sylvestris, L. Wild Chervil, P. April—June. Common.

C. temulentum, L. Rough Chervil. B. June—August. Frequent.

MYRRHIS. *Tourn.* Cicely.

M. odorata, Scop. Sweet Cicely. P. May—June. Near Heath, Crigglestone, Silkstone.

ORDER—ARALIACEÆ.

HEDERA. *Linn.* Ivy.

H. Helix, L. Common Ivy. S. October—November. Common.

ORDER—CORNACEÆ.

CORNUS. *Linn.* Cornel. Dogwood.

C. sanguinea, L. Wild Cornel, or Dogwood. S. May—June. Frequent. This wood is in many parts of England used by butchers and others to make skewers—hence one of its common names Prickwood.

ORDER—LORANTHACEÆ.

VISCUM. *Linn.* Mistletoe.

V. album, L. Common Mistletoe. S. March—May. Naturalised on a tree in a garden at St. John's, Wakefield, and at Walton Hall, the seat of the late Mr. Waterton.

ORDER—CAPRIFOLIACEÆ.

ADOXA. *Linn.* Moschatel.

A. Moschatellina, L. Tuberous Moschatel. P. April—June. Hugset Wood, near Barnsley.

SAMBUCUS. *Linn.* Elder.

S. nigra, L. Common Elder. S. or T. June—July. Common.

VIBURNUM. *Linn.* Guelder Rose.

V. Opulus, L. Common Guelder Rose. S. June—July. Frequent in woods.

LONICERA. *Linn.* Honeysuckle.

L. Periclymenum, L. Honeysuckle, or Woodbine. S. June—October. Frequent. It is a common thing to see the Woodbine in flower in October—when all the plants that have flowered early are in fruit.—Is there any difference between the late and early plants?

ORDER—RUBIACEÆ.

GALIUM. *Linn.* Bedstraw.

G. verum, L. Yellow Bedstraw. R. June—September. Common.

G. cruciatum, L. Crosswort Bedstraw, or Mugwort. P. April—June. Common.

G. saxatile, L. Smooth Heath Bedstraw. P. June—October. Common in heathy and dry moory places.

G. uliginosum, L. Rough Marsh Bedstraw. P. July—August. Frequent.

G. palustre, L. White Water Bedstraw. P. July—August. Common.

G. Mollugo, L. Great Hedge Bedstraw. P. July—August. Common.

G. tricorne, With. Rough Fruited Corn Bedstraw. A. June—August. Occasionally on the Limestone about Pontefract.

G. Aparine, L. Goose-grass, or Cleavers. A. June—August. Common.

SHERARDIA. *Linn.* Woodruff.

S. arvensis, L. Blue Field Madder. A. April—August. Common. Varying much in size and appearance, according to place of growth.

ASPERULA. *Linn.* Woodruff.

A. odorata, L. Sweet Woodruff. P. May—July. Frequent in Woods.

A. cynanchica, L. Small Woodruff, or Squinancy Wort. P. June—July Went Valley, (Mrs. Watson.)

ORDER—VALERIANACEÆ.

VALERIANA. *Linn.* Valerian.

V. dioica, L. Small Marsh Valerian. P. May—July. Common.

V. officinalis, L. Great Wild Valerian. P. June—August. Common. Much liked by cats, and rats are likewise said to be attracted by the fœtid smell of the roots. A common name is *All Heal*, (Hooker.)

FEDIA. *Vahl.* Corn Salad.

F. olitoria, Vahl. Corn Salad, or Lamb's lettuce. A. April—June. Common.

F. dentata, Vahl. Smooth narrow-fruited Corn Salad. A. June—August. Horbury, and occasionally in corn fields in the neighbourhood.

ORDER—DIPSACEÆ.

DIPSACUS. *Linn.* Teasel.

D. Fullonum, L. Fuller's Teasel. B. August. An escape from cultivation.

D. sylvestris, L. Wild Teasel. B. August—September. Frequent.

SCABIOSA. *Linn.* Scabious.

S. succisa, L. Devil's-bit Scabious. P. July—September. Frequent on the limestone. The root ends abruptly as if it had been bitten off—hence Gerard says, "old fantasticke charmers report, that the divell did bite it for enuie, because it is an herbe that hath so many good vertues, and is so benificial to mankinde." Parkinson thinks, "the Monkes and Fryers were the inventors of the Fable;" whilst an "old writer" quoted in Sowerby's 3d. Ed. English Botany says, "This plant is so named, because with this root the Devil practised such power, that the Mother of God, out of compassion, took from the Devil the means to do so with it any more; and in the great vexation that he had, that the power was gone from him, he bit it off, so that it grows no more to this day."

Reports of Societies.

BOTANICAL SOCIETY OF EDINBURGH.

XXIX SESSION—IX. MEETING.

The Society met in the Histological Class-room, at the Royal Botanic Garden, on Thursday, 13th July—Dr. Alexander Dickson, president, in the chair.

The following donations to the Library were laid on the table:—Catalogue of the Indigenous and Exotic Plants growing in Ceylon; by Alexander Moon, 1824. History of Drugs; by M. Pomet, 1748. Presented by Mrs. Bevan, per Mr. Brand.

The following donations to the Herbarium:—From Mrs. Royle, part of the Indian collections of her husband, the late Dr. Forbes Royle, transmitted through Dr. Forbes Watson; from Mr. John Sim, Perth, specimens of *Potamogeton nitens;* from Dr. F. B. White, specimens of *Tortula Mülleri*, collected near Craiglockhart; from Mr. P. K. Vartan, medical missionary, plants from Nazareth; from Professor Piazzi Smyth, plants from Egypt; from Dr. G. R. Tate, specimens of *Atriplex littoralis*, from the Isle of Wight.

The following donations to the museum at the Botanic Garden:—From Dr. Cleghorn, bark of *Bauhinia diphylla;* from Dr. G. Bedie, sandal wood oil and the roots of a plant used as salad in India; from Dr. Thomas Balfour, croix seeds; from Dr. Mackenzie, fan made of palm leaves and bamboo cane.

The following communications were read:—

I. Supplementary Notes upon the Vegetation of the Sutlej Valley. By H. Cleghorn, M.D.

II. Notes on the Forests of India. By Dr. Brandis, Inspector-General of Forests in India.

III. On the Influence of Forests on Climate. By M. Becquerel. Translated from the French and communicated by Mr. G. M. Lowe.

Mr. Lowe gave a condensed account of M. Becquerel's paper on forests, and their effects on climate, read before the French Academy in May last. The first portion of the paper gives an account of the extent of forest land in France from the time of Julius Cæsar. The second is on the action of forests on climate. This, he says, depends, firstly, on their extent; secondly, on the height of the trees and their nature whether having caducous or persistent leaves; thirdly on the amount of evaporation by the leaves; fourthly, on their capability af absorbing and radiating heat; and, fifthly, on the nature and physical condition of the soil and subsoil. This influence is also exerted on running streams and springs.

IV. On the History and Structure of *Urococcus*. By Charles Jenner, Esq.

This little known and rare plant was first noticed by Mr. Hassall in 1845, and was by him named *Urococcus*, from the circumstance of a peduncular process, as he called it, depending from the nucleated cell, which it has in common with Agardh's *Hæmatococcus* and others. Mr. Jenner exhibited a set of microscopic preparations and a series of beautiful drawings, executed by Mr. Neil Stewart, showing that the process called a peduncle by Hassall, and subsequently by Berkeley, Henfrey, and Braun, is in reality a stem, bearing on its apex the nucleated cell. Mr. Jenner showed the close affinity between *Glœocapsa* and *Urococcus*, and illustrated the more complicated structure of the latter by a reference to the simple structure of the former. Mr. Jenner gathered his plants in some caves on the west coast of Arran.

V. On the Occurrence of *Calluna vulgaris* in Nova Scotia. By Professor Lawson, Dalhousie College, Halifax, N. S.

Professor Lawson referred to the various localities where the plant had been discovered in America, and enclosed specimens collected near Halifax, in 1850.

Professor Balfour noticed the several rare plants lately collected near Edinburgh, including *Schœnus nigricans*, Largo Links, (Mr. Sadler), *Carex incurva*, Largo Links (Mr. Gilbert Stewart), &c.

A note was read from Mr. G. W. R. Hay, in which he referred to the tendency this season of ternate-leaved plants to produce four leaflets, as in clover, laburnum, strawberries, &c.

Dr. Kirk presented specimens of *Cheilanthes Kirkii*, from Africa, and seeds of a new banana, called *Musa Livingstonii*.

Mr. M'Nab placed on the tables a collection of interesting Alpine plants and ferns, also a fine fruited plant of a rat-tailed radish from Saharunpore.

Norwich Naturalists' Society.—The usual fortnightly meeting of this society was held on Monday evening, August 7th, in the rooms, Surrey Mews, Mr. I. S. Sayer, President, in the chair. The hon. secretary, Mr. T. E. Gunn, read a paper on the Pallas Sand Grouse, *Syrraptes paradoxus*, and exhibited drawings of the birds, the feet, and the sternum or breast bone of the same. The paper contained an account of the principal localities visited by the extraordinary flight of wanderers during the year 1863; the accounts of which are chiefly gleaned from the numerous records of their occurrence, which appeared in the various Natural History Periodicals that were published during that period. It also contained a few brief remarks relating to their habits, peculiar form of foot, &c., and a full description of their plumage, shewing the distinction between the sexes. Mr. J. Perry exhibited several examples of *Neuria Saponariæ*, which he had taken at Horsford during the previous week. Amongst the fresh captured specimens of lepidoptera exhibited by Mr. T. E. Gunn, were *Melanthia albicillata*, *Scotosia dubitata*, *Cosmia diffinis*, var. and *Amphipyra pyramidea*.

Richmond and North Riding Naturalists' Field Club.—Monthly meeting, Tuesday August 8th. The president, Mr. E. Wood, F.G.S. in the chair. The president exhibited some very interesting geological specimens collected during a recent tour in the Highlands, including *Graptolites*, *Albertite*, and some fine specimens of *Mica ;* he also exhibited specimens of Granite, containing *Mica* in very large quantities, and some fine specimens of elastic Sandstone from the coal measures, an ancient millstone from the neighbourhood of Inverness, supposed to be 2000 years old, and a flint axe picked up on a moor near Richmond. Mr. J. Aspdin exhibited several larvæ of the Death's Head Moth, *A. atropos*, and also a series of the Scarlet Tiger Moth, *C. Dominula*. Mr. W. P. Horne exhibited some tokens formerly used by tradesmen, in Richmond, coined in the year 1667 ; which he presented to the Museum of the Club, together with a mahogany case, for which a vote of thanks was unanimously accorded. The following new members were elected :—Rev. —Pybus of Hudswell, Mr. R. Watson. Mr. T. Blades, and Mr. G. Mattison of Richmond. After a vote of thanks to the chairman, the meeting adjourned to the second Tuesday in September.

Observations.

The Zoological Society of London have just added to their collection a very fine male *Chimpanzee*. The meeting between the stranger and the one already in the Society's possession was very cordial ; embracing each other in the most loving manner, they became at once firm friends, the Orang looking on at this meeting with, apparently, stolid indifference.

Large Pearl in Unio margaritiferus.—I have had three specimens of *Unio margaritiferus* brought to me from the river Tay, near Kirkcudbright, where it is found in abundance. On cleaning them I found in one a fine clear pearl about the size of a large pea ; clear pearls of this size are comparatively rare, the majority being of a brownish colour.—Sidney Smith, Church, near Accrington.

The Death's Head Hawk Moth, &c.—This year will I think be noted as a good year for *Lepidoptera* by most collectors, accounts from all quarters being satisfactory. I have noticed several species in this neighbourhood that have not been seen for several years before. The Humming-bird Hawk Moth has been plentiful, and a few days ago a caterpillar of the Death's Head Hawk Moth, *Acherontia atropos*, was brought amongst some potatoe tops to a green-grocer's shop in this neighbourhood. I enquired from what locality they had been brought, and was told from Rufford, near Southport ; and on going to that neighbourhood I found a person who had taken eight caterpillars, all of which had taken to the earth except one which I brought with me, and which has since gone down. I think the present would be a good opportunity for any person wanting this fine moth, to fill up the vacancy ; as it will no doubt be tolerably plentiful in the early part of October, at which time it is on the wing.—Sidney Smith, Church, near Accrington.

Occurrence of Acherontia atropos in Leeds.—I have in my possession, a very fine specimen of the Death's Head Moth, taken in the garden of Mr. Pepper, North-street, Leeds ; the insect is of rare occurrence in or near this town.—Robert Cundall, Victoria Museum, Beckett-street, Leeds.

Discovery of the Larva of Eupithecia begrandaria, Bodv. In June this year, Mr. J. B. Hodgkinson and I took this insect on the wing from 5 p.m. to 10 p.m. on Pilling Moss, North Lancashire, near a clump of scrub birches, among which grew a few clumps of sweet gale, about two miles from the edge of the moss, on the Whinmarley side ; the said locality being once famous for *begrandaria*, but no one had visited it for many years. Here then its food

plant must be, and we were not long in finding that the Cow Wheat, *Melampyrum pratense*, growing under the sweet gale, was the only strange plant not common to every part of the moss ; a clue once gained, I have never let it rest since, and on Sunday last, being at Burnt Wood, in Staffordshire with Mr. Greening and H. V. Moss, the moment I saw the plant growing we began to hunt for this long sought for larva, and soon Mr. Greening handed me a pug larva feeding on the small flower of this plant, which we have no doubt is *Eupethecia begrandaria*, and I write now, not to describe the larva, but to call attention to this plant, before it is too late in the season, that all who have the plant near them, and wish to breed the insect, may know that it is still feeding in the flowers, eating the stamens, and is rather like the larva of *E. venosata*, with narrower extremities, the broad dorsal lines being sometimes more pinky than in that species, and the outer lines well defined.—C. S. Gregson, *August* 10*th*, 1865.

Obituary.

Hugh Cuming, Esq., F.L.S., C.M.Z.S., died after a short illness, at his residence in Gower-street on the 10th of August last. This eminent conchologist was born in February, 1791, at West Alvington, Kingsbridge, Devon. At this place, where shells abounded, was developed and fostered that taste for the study of Conchology which eventually became his ruling passion, and which in after life made him celebrated in that particular branch of Natural History. At the usual age Mr. Cuming was apprenticed to a sailmaker, and subsequently settled himself, in this business, at Valparaiso, where he remained until 1827, when he relinquished business, built himself a yacht and sailed for a cruize among the islands of South Polynesia. The first place he touched at was the little island of Juan Fernandez, and proceeding thence in the direction of the Society islands, he visited Pitcairn's Island, memorable in history as an instance of an uninhabited island having become colonized by a fine athletic family of christians, speaking English, descendants of the mutineers of the "Bounty." Thirty-five years had passed since the mutiny ; and old John Adams, the good seaman, who had been pressed into it, still survived. Mr. Cuming found him nobly engaged in the pastoral and patriarchal offices, so touchingly described by Captain Beechey, and having spent a week with him in his house, he continued his voyage. The rich Conchological novelties that now rewarded Mr. Cuming's toil, induced him to spend upwards of a twelvemonth among the various little known islands of this wide expanse of ocean, and he reached his home laden with Polynesian spoils collected from sea and land. Soon after his return to Valparaiso, Mr. Cuming commenced preparations for another Conchological voyage, selecting this time the western coast of South America, and after nearly two years exploration of this coast, Mr. Cuming returned to England with a very rich collection. It was in 1831, that the scientific meetings of the Zoological Society of London began to be enlivened by the brilliant displays of new shells described from Mr. Cuming's cabinet, by the late Mr. Broderip, and the late Mr. B. Sowerby, while Prof. Owen undertook the severer task of describing the anatomy of some of the more interesting of the Mollusks. In 1835 Mr. Cuming proceeded to the Philippine islands. Furnished, through the influence of the Earl of Derby, with letters from the authorities at Madrid to the Governor and the Archbishop of Manilla, he received every attention and assistance ; every where a hospitable reception, with apartments, and the best of living followed, and the services of the school children were secured to scour the woods for the snail shells, Mr. Cuming always liberally rewarding their exertions. The natives could not understand his object in gathering shells, and

frequently was the inquiry put, "for what purpose did he collect such a quantity of shells?" It was in vain that he endeavoured to explain, that they were to put in cabinets as specimens of Natural History. The natives of the Philippine islands are in the habit of making an ash of burnt shells to assist in chewing the betel nut. They cut the nut into slices and wrap them up with the shell ash, in leaves of the pepper plant. He resorted to the expedient of telling them that his shells were all destined for use in a similar process in England. This satisfied their enquiries. Wherever Mr. Cuming travelled he exercised great influence over the natives by practising as a medicine man; he always carried a supply of quinine with him, and found it an unfailing remedy in the cure of fever. Hence he was everywhere feared and sought after, and his statements were listened to with the same respect for sincerity as those of the priest. After four years exploration and collecting in the Philippine islands, Mr. Cuming returned to England, and from that time up to within a week of his death (a period of nearly thirty years), was untiringly engaged in arranging and completing his collection. And so has passed away from our midst one of the greatest conchologists the scientific world has ever seen.—W.

Sir William Jackson Hooker, K.H., F.R.S., F.L.S. D.C.L., Director of the Royal Botanic Gardens, Kew, died on the 12th August last. Sir William was born at Norwich, in 1785, and from an early age Natural History pursuits engaged his attention. Eventually devoting himself to the study of Botany, he became Regius Professor of Botany in the University of Glasgow. That appointment he gave up for the directorship of the Royal Gardens, at Kew. In 1835 he received the honour of knighthood, at the hands of William IV., and in 1845, the University of Oxford conferred on him the degree of D.C.L. Sir William was the author of several botanical works, and contributed the botanical portion of Admiral Beechey's account of his voyage of discovery in the Arctic regions.—W.

News.

Capture of Sitones Waterhousei.—I was fortunate enough to meet with the above insect last autumn in the Isle of Wight, in which locality it has not, I believe, hitherto been recorded as occurring.—T. Blackburn, *June* 1865.—*Entomologist's Monthly Magazine.*

Exchange.

Lepidoptera.—I have duplicates of the following for which I shall be glad to receive offers of exchange, *L. putrescens*, *A. obelisca*, *A. puta*, *T. pastinum*, also a few *P. Arion*.—Thomas Terry, Princess-street, Babbicombe.

Lepidoptera.—I have the following *Lepidoptera* in duplicate, all in good condition, and I shall be glad if any one can assist me to my wants, some of which I mention:—Duplicates, *A. australis*, *A. gemina*, *L. cespitis*, *M. anceps*, *X. petrificata*, *A. luctuosa*, *E. nigra*, *N. saponariæ*, *E. lichenea*, *L. putrescens*, *L. straminea*, *S. anomala*, *A. saucia*, *S. alveolus*, *C. temerata*, *C. edusa*, 1. *T. betulæ*, 1. *A. ornata*, *A. citraria*, 1. *E. viminalis*, *P. Arion*, *C. davus*, *P. chi*, *T. munda*, *A. cursoria*, *P. serena*, *D. cucubali*, *H. marginata*, 1. *C. cribrum*, *X. semibrunnea*, *A. derivata*, *A. aquilina*, *A. prodromaria*, *I. vernaria*, *C. psittacata*, 1. *O. gonostigma*, *S. illustraria*, *X. rhizolitha*, 1. *D. chaonia*, *A. nigricans*, *A. obelisca*, *T. piniperda*. Desiderata, *D. hamula*, *L. testudo*, *N. geminipuncta*, *A. agathina*, *T. subtusa*, *T. retusa*, *D. Oo.*, *C. chamomillæ*, *B. roboraria*, *M. hastata*, *A. ochrata*, *E. fuscantaria*, *E. erosaria*, &c.—Frederick Buckton, 6, Beech Grove Terrace, Leeds.

Original Articles.

THE VEGETATION OF SPITZBERGEN COMPARED WITH THAT OF THE ALPS AND PYRENEES.

By Chas. Martins.

Prof. of Natural History, and Director of the "Jardin des Plantes," &c., at Montpellier.

(*Continued from page* 106.)

All the valleys, both in the North and South of Spitzbergen, are filled by glaciers, which descend to the sea-line. Their length is variable; the longest I have seen, that of Bell Sound, being 18 kilometres (59,000 feet,) long, by 6 kilometres (19,684 feet) wide; and that in Magdalena Bay 1,840 metres (6,036 feet) long by 1580 metres (5,181 feet) wide at its sea-edge. According to Scoresby the two largest glaciers are those of the South Cape, and another at the north of Horn Sound, which are both 20 kilometres (12 miles) wide, at their sea-edge, and of unknown length. The seven glaciers which border the coast to the north of Prince Charles' Island, are each nearly 4 kilometres (13,123 feet) wide. All these glaciers form at their inferior extremities great walls or escarpments of ice, of a vertical height varying from 30 to 120 metres (90 to 400 feet). The earlier Dutch and English navigators seeing these colossal walls of ice, higher than the masts of their vessels, described them as icebergs, not suspecting their analogy with the glaciers of the interior of the continent; the name still remains; and Phipps, Parry, and Scoresby himself were ignorant of the nature of these ice rivers, rolling away in billows under their eyes. When I approached Spitzbergen for the first time, in 1858, I immediately recognised the glaciers I had so often admired in Switzerland. Their origin is the same, the difference being owing to the climate, the neighbourhood of the sea, and the lower elevation of the mountains of Spitzbergen.

There are neither rivers nor rivulets in Spitzbergen, as the glaciers descend to the sea-level. A feeble streamlet sometimes escapes from the flanks of the glacier, but it is speedily arrested. Springs are also unknown as the soil is always frozen hard at a depth of some few inches.

The geology of the western coasts has been studied by Keilhan, the members of the French Commission, and more recently by M.M. Nordenskiold and Blomstrand. Without entering into details possessing but very little interest to the botanist, I may say that the mountains of Spitzbergen are in general formed of crystalline rocks. The seven isles to the north of the archipelago are entirely granitic, this rock forming the extreme land of the north of Europe. More to the south, limestones, frequently dolomitic make their appearance, belonging probably to ancient formations and traversed by threads of hypersthene rock, a species of porphyry very rare, and only found in Scandinavia and Labrador. In other localities we find the same rocks; but in the straits of Hinlopen and near Bell Sound a fossiliferous limestone is found. From an examination of the fossils M. de Konninck refers them to the Permian, a formation overlying the coal measures, and deriving its name from the government of Perm in Russia. In King's Bay, M. Blomstrand has found a carboniferous rock which is slightly combustible. In spite of all the difficulties which the geologist must experience in studying a locality covered by snow and ice, we may say, from the indications we possess, that Spitzbergen belongs to the oldest formations of the earth; islands, thrown up at the origin of the globe, and in which the deposits of the Jurassic cretaceous, and tertiary formations are altogether absent.

III.—FLORA OF SPITZBERGEN.

From the sketch we have given of the climate and physical constitution of Spitzbergen, the title of this chapter would almost appear a misnomer. What vegetation can there be in a country covered with snow and ice, where the mean temperature of summer is 1°3 (35° Fahr) that is to say inferior to the month of January at Paris? Are there any plants capable of living and propagating themselves under such conditions of soil and climate? Nevertheless on approaching Spitzbergen certain spots here and there, may be discerned, which are favourably exposed and where the snow has disappeared. These patches of earth scattered in the middle of the snowfields which surround them, seem at first completely naked; but a nearer approach discovers a number of small microscopic plants closely pressed on the soil, hidden in fissures, spread against the talus facing the south, screened by stones, or hidden amongst the mosses and grey lichens which carpet the rocks. Humid depressions, covered by larger mosses of a bright green colour, *Eremodon Wormskioldii*, Brid. *Polytrichum alpinum*, L. *Bryum julaceum*, Schr. &c., form an agreeable repose for the eye, tired by the blackness of the rocks, and the uniform white of the snow. At the foot of the cliffs fre-

quented by sea-birds, where the guano both warms the soil, and favours vegetation, *Ranunculus*, *Cochlearea*, and grasses sometimes attain to the height of several inches, and in the midst of fallen rocks, a yellow poppy, *Papaver nudicaule*, is sometimes found, rivalling some of our garden favourites. No tree or shrub is anywhere to be seen ; the last of these, the white birch, and the pine being last found in Norway in 70° N. lat. Still some of the plants have a woody texture ; as two species of low growing willows, one of which *Salix reticulata*, is found also on the Alps, and a low shrub, *Empetrum nigrum*, growing amongst the damp mosses, is also found on the peaty moors of Europe, as far south as Spain and Italy. The remaining plants are of very humble growth, and without stems ; many of them so small as almost to escape the eyes of the botanist, unless he looks carefully for them ; the proof of this may be seen in the slow growth of the list of phanerogamous plants found in Spitzbergen, which has only been completed, little by little, from the successive researches of the travellers who have visited these islands. Thus, in 1675, Frederick Martens of Hamburg, described and figured only eleven species of terrestrial plants ; and Phipps in 1775 reports only twelve which were named and described by Solander. Scoresby, being almost wholly on the sea, the total number of species gathered by him only reaches fifteen, described in 1820 by the celebrated Robert Brown. In 1833, Captain, now General Sabine, gathered twenty-four, which were determined by Sir William Hooker, who also examined and described the forty species collected by Parry in 1827, during a six months sojourn in the north of Spitzbergen. Then Sommerfelt named forty-two species brought by Keilhan, the same year, from the southern half, and from Bear Island. In 1838 and 1839 a Danish botanist, M. Vahl, and myself, gathered fifty-seven species in Bell Sound, Magdalena Bay and Smeerenberg. The voyage of M.M. Torrell, Nordenskiold, and Quennerstedt, in 1858 enriched the flora by six new species, and the Swedish Scientific Commission in 1861, by twenty-one. M. Malmgren, the botanist of the expedition, in eliminating the synonymy, and distinguishing the species confirmed by his predecessors, raised the total number of the phanerogamic plants to ninety-three.

I am taking no notice of the *Cryptogamia*—the mosses which carpet the bottoms of humid depressions, and cover the turfy morasses, nor of the lichens which grow upon the stones up to the summit of the mountains, and resist the most rigorous cold ; for the greater part of them are never uncovered by the snow. M. Lindblom made the number of these one hundred and fifty-two, before the two last Swedish expeditions. We thus see the law, propounded by Linnæus, that the *Cryptogamia* predominate towards the

north, clearly exemplified ; and adding these latter to the Phanerogamia, we make the total number of species of Spitzbergen into two hundred and forty-five. The number of Phanerogams in Spitzbergen—which are only ninety-three—is very restrained. Iceland, situate under the 65° N. lat., the area of which is much smaller, includes four hundred and two species. As we advance further south the proportion rapidly augments ; thus, Ireland, again, smaller than Spitzbergen, numbers nine hundred and sixty phanerogams. The plants of this distant island are then the lost children of the European Flora, those which can best resist the cold, or rather, since the snows cover them in winter, those which can live and flower with the least amount of heat.

Of the ninety-three phanerogams of Spitzbergen, only one species is alimentary, viz :—*Cochlearia fenestrata*, the three congeners of which *C. officinalis*, *C. danica*, and *C. anglica*, inhabit the shores of the Atlantic ocean. These plants containing an acrid and bitter principle, are employed in medicine as *anti-scorbutics*, but are not in any sense alimentary. In Spitzbergen owing to the absence of atmospheric heat, these principles are so slightly developed, that the *Cochlearia* can be used as a salad, a precious boon for sailors, for these anti-scorbutic principles, though weakened are still present, and prevent disease which the cold, the humidity, the use of salt-meats, and the privation of vegetables, conspire to develope. The grasses during the summer, are a grand resource for the rein-deer, the only herbivorous animal found in Spitzbergen.

I must now give a complete list of the plants of Spitzbergen arranged in the natural orders.

FLOWERING PLANTS OF SPITZBERGEN.

[N.B.—The species in italics are found in France. Those marked with an asterisk * are exclusively arctic, and are not found in Scandinavia.]

Ranunculaceæ.—*Ranunculus glacialis*, L. ; R. hyperboreus, Roth ; R. pygmæus, Wbg. ; R. nivalis, L. ; R. sulfureus, Sol. ; R. arcticus, Rich. *.

Papaveraceæ.—Papaver nudicaule, L.

Cruciferæ.—*Cardamine pratensis*, L. *C. bellidifolia*, L. *Arabis alpina*, L. ; Parrya arctica, R. Br. * ; Eutrema Edwardsii R. Br. * ; Braya purpurescens, R. Br. ; Draba alpina, L. ; D. glacialis, Adams, * ; D. pauciflora ? R. Br. * ; D. micropetala ? Hook, * ; D. nivalis, Liljebb. ; D. arctica, Fl. Dan. ; * D. corymbosa, R. Br. * ; D. rupestris, R. Br. ; D. hirta, L. *D. Wahlenbergia.* Hartm. ; Cochlearia fenestrata ; R. Br.

Caryophyllaceæ—*Silene acaulis.* L. ; Wahlbergella (Lychnis) apetala.

Fr. , W. affinis, Fr ; Stellaria Edwardsii. R. Br. ;* S. humifusa, Rottb. * *Cerastium alpinum*, L. ; Arenaria ciliata ; A. Rossii. R. Br. ; A. biflora. L. ; *Ammadenia (Arenaria) peploides*, Gm. ; *Alsine rubella*, Wbg. ; Sagina nivalis, Fr.

Rosaceæ.—*Dryas octopetala.* L. ; Potentilla pulchella. R. Br. * ; P. maculata, Pourr. ; P. nivea, L. ; P. emarginata, Pursh. *.

Saxifragaceæ.—Saxifraga hieracifolia, Waldst. and Kit. ; S. nivalis, L. ; S. foliosa, R. Br. ; *S. oppositifolia*, L. ; S. flagellaris, Sternb. * ; *S. hirculus*, L. ; *S. aizoides*, L. ; S. cernua, L. ; S. rivularis, L. ; S. cæspitosa, L. ; *Chrysosplenium alternifolium*, var. tetrandrum, Ehr. Fr.

Synantheræ (Compositæ). *Arnica alpina*, Murray. *Erigeron uniflorus*, L. ; *Nardosmia (Tussilago) frigida*, Cass. ; *Taraxacum palustre*, Sm. ; T. phymatocarpum, Vahl. *

Boraginaceæ.—Mertensia (Pulmonaria) maritima; L.

Polemoniaceæ.—Polemonium pulchellum, Leb. *

Scrophulariaceæ.—Pedicularis hirsuta, L.

Ericaceæ.—Andromeda tetragona, L.

Empetraceæ.—*Empetrum nigrum*, L.

Polygonaceæ.—*Polygonum viviparum*, L. *Oxyria digyna*,Campb.

Salicaceæ—*Salix reticulata*, L. ; S. polaris, Wbg.

Juncaceæ.—Juncus biglumis, L. ; Luzula hyperborea. R. Br. ; L. arctica, Blytt.

Cyperaceæ.—*Eriphorum capitatum*, Host. ; Carex pulla, Good. ; C. misandra, R. Br. ; C. glareosa, Wbg. ; C. nardina, Fr. ; *C. rupestris*, All.

Graminaceæ.—Alopecurus alpinus, Sm. , R. Br. ; Aira alpina, L. ; Calamagrostis neglecta, Ehr. ; *Trisetum subspicatum*, P. Beauv. ; Hierochloa pauciflora, R. Br. * ; Dupontia psilosantha, Rupr. * ; D. Fischeri, R. Br. * ; *Poa pratensis*, var. alpigena, Fr. ; *P. cenisia*, All. ; P. stricta, Lindeb. ; P. abbreviata, R. Br. * ; P. Vahliana, Liebm. ; Glyceria angustata, Mgr. * ; Catabrosa algida, Fr. ; C. vilfoidea, Anders. * ; Festuca hirsuta, Fl. Dan. ; F. ovina, L. ; F. brevifolia, R. Br.

Botanists will recognise amongst this list, a certain number of species found in other countries. Thus, of the ninety-three species of Spitzbergen, sixty-nine are found in Scandinavia, and twenty-eight even in France, the latter being printed in italics. *Cardamine pratensis*, *Taraxacum palustre*, and *Festuca ovina*, are found on our plains ; *Arenaria peploides*, grows on our sea-coasts ; *Chrysosplenium alternifolium*, in our damp mountain woods; *Empetrum nigrum* and *Saxifraga hirculus*, are found on our turfy bogs ; the other species live on the most elevated parts of the Alps and Pyrenees.

Let not the reader hasten to admit the theory of multiple centres of creation, and to suppose that the twenty-eight French species, had not a common origin with their brethren of Spitzbergen, but may have appeared simultaneously, or at different epochs, around the pole, on the French moors, and on the snowy summits of the Alps and Pyrenees. The recent progress of botanical geography does not admit of such a conclusion. We remark firstly that the *flora* of all the glacial countries that surround the pole, is remarkably uniform. M. Malmgren informs us that of the ninety-three species of Spitzbergen, eighty-one are found in Greenland. More to the west, the islands which border Lancaster, Barrow, and Melville straits, in N. America, situate under the 78° N. Lat., have fifty-eight species in common with northern Spitzbergen. Those which are missing in America, are generally such species as grow on the western coast of the island, and belong more particularly to the continental *flora* of northern Europe. More to the east, in Siberia, on the peninsula of Taymir, (100° E. Long. and 75° N. Lat.) M. Middendort gathered one hundred and twenty-four flowering plants of which fifty-three are also found in Spitzbergen.

We thus see, that the crown of modest flowers which encircles the northern pole, is not varied, under different meridians, in the same manner as the other vegetable zones which encircle the globe ; they are throughout, the same plants, or species belonging to the same genera, and the same families ; they are always the *grasses*, *Cruciferæ*, *Caryophyllaceæ*, and *Saxifragaceæ*, which prevail ; and amongst the genera, *Draba*, *Saxifraga*, *Ranunculus*, *Carex*, and *Poa*. All these species are perennial ; this is a condition of their existence, for it is not to be expected, that they should, each year, perfect their fruit and ripen their seeds ; an annual plant totally disappears from any country, if in any single year it fails to bring its seeds to maturity.

We have then an Arctic *Flora* ; but that of Spitzbergen is also a prolongation of the Scandinavian *flora*, which intermixes in this island with the arctic *flora* proper ; indeed the two regions have sixty-nine species in common. There remains then twenty-four species for Spitzbergen, but the whole of these are found in N. America, North of Siberia, and Nova Zemla ; these are, *par excellence*, the arctic *flora*, those which best characterize the circumpolar vegetation. They are distinguished from the others in the list, by an asterisk. Thus the *flora* of Spitzbergen consists of two *floras*, the one European, the prevailing one on account of the proximity of Scandinavia ; the other, Arctic, that is American and Siberian.

CATALOGUE OF THE BIRDS OF SHETLAND.

By Henry L. Saxby, M.D.

(*Continued from page* 126.)

II.—MIGRANT NATIVES.

Birds of this group visit us in spring, and remain to breed ; with very few exceptions they all retire before winter. They are only seventeen in number :—

Wheatear, *Sylvia œnanthe.* (Steinkle. At Baltasound, known also as the Stonechat). Extremely abundant from the middle of April until the middle of September. Young birds remain rather later.

Meadow Pipit, *Anthus pratensis.* (Hill sparrow, Teetick.) Appears to be only a summer visitor, and said to be more plentiful than formerly.

Lapwing or Pewit, *Vanellus cristatus.* A regular summer visitor. Some years ago this species was almost unknown here ; now, however, it is very common, several colonies having been established in this island (Unst,) alone since my first visit in 1854.

Oystercatcher, *Hæmatopus ostralegus,* (Shelder or Shalder). Everywhere common. Arrives about the middle of March.

Whimbrel, *Numenius phœopus.* (Tang whaap, Little whaap). Arrives in small parties in May. Still rather numerous in some localities.

Landrail or Corncrake, *Gallinula crex.* Abundant during the summer months.

Guillemot, *Uria troile,* (Longie). Probably never entirely deserts the coast, although it is rarely met with in winter; re-appears near the cliffs very early in spring.

Ringed Guillemot, *Uria lacrymans.* By no means uncommon in summer, breeding both in company with, and apart, from *U. troile.* Almost the only evidence which I have been able to collect, as to the right of this bird to be considered a distinct species is contained in the *Zoologist* for 1864, (p. 9241). See also a paper in the same periodical, by the late Mr Nolley, (p. 3477).

Puffin, *Mormon fratercula,* (Norie, Tammynorie). Very numerous in summer, but scarcely ever seen in winter.

Razorbill, *Alca torda,* (Wilcock not Willock). Still breeds in some of the cliffs, but in small numbers compared with those of a few years back. Specimens are occasionally obtained in winter.

Arctic Tern, *Sterna arctica*, (Tarrock, Piccatarie). Very common in summer.

Kittiwake, *Larus tridactylus*, (Waeg). A few remain all the winter, but by far the greater number are migratory. In some parts, and especially in Burrafrith, and its neighbourhood they breed in thousands. Young birds during the first year are called in Unst, "gield kittiwakes."

Lesser Blackbacked Gull, *Larus fuscus*, (Saithe fowl, or more commonly said fool). Common in summer. I have only one recorded instance of its occurrence in winter. Although it is here migratory, it resides in Orkney throughout the year.

Great Skua *Lestris, catarractes*, (Skooi, Bonxie). Once very numerous, but now, owing to the high price offered for its eggs, it is rapidly disappearing. Only five pairs were remaining at Hermaness last year. In future, however, they will be carefully protected by the proprietor of the land.

Richardson's Skua, *Lestris Richardsoni*, (Shoor Alan, Dirty Alan). Very numerous in many localities, especially in Noss, where they and other sea-birds are strictly protected.

Manx Shearwater, *Puffinus anglorum*, (Lyrie). Summer, in small numbers.

Storm Petrel, *Thalassidroma pelagica*, (Spencie, Swallow). Breeds abundantly rather late in the summer, but so far as I am aware, it is never observed here at any other season.

III.—WINTER VISITORS.

All of these birds are more commonly seen in winter than at any other season, the greater number of them arriving regularly. A very few occasionally remain to breed. This group contains thirty-seven species.

Iceland Falcon, *Falco islandicus*, (Iceland hawk). Only occasionally seen in winter although it was formerly a regular visitor.

Snowy Owl, *Strix nyctæa*, (Kat-yogl, Yogl, White owl). Previously to June, 1864, when an adult living specimen procured in this island was brought to me, I believed this species to be only a winter visitor, although it probably bred here many years ago. This individual exhibited every appearance of having lately been engaged in incubation, and was accompanied by a young well fledged bird. It is scarcely probable that the latter was hatched here, otherwise the parent birds would have been observed in the neighbourhood during the spring. Two adults were seen and shot at upon the hills at Unst last May.

Blackbird, *Turdus merula.* Said to be of not unfrequent occurrence, in the south of Shetland, but it was certainly unknown in Unst until very lately.

Goldencrested Regulus, *Regulas cristatus.* Small parties visit the gardens at Halligarth nearly every winter.

Snow Bunting, *Emberiza nivalis,* (Snow fowl, or Snaa fool). Abundant during winter, although great numbers go southwards in autumn and return in spring. I have once obtained the eggs here.

Chaffinch, *Fringilla cœlebs.* Once extremely rare. Now, however, considerable flocks arrive in autumn, many individuals remaining throughout the winter. Among the latter there are nearly always a few females, some of which I have shot and examined in order to place the fact beyond all doubt.

Lesser Redpole, *Fringilla linaria.* A winter seldom passes without the appearance of a few small flocks.

Mealy Redpole, *F. borealis.* More common than was at first supposed, having probably been mistaken for the lark, or for the preceding species. I have shot them every winter of my residence here.

Crossbill, *Loxia curvirostra.* Flocks of considerable size used to appear in autumn, but for the last two seasons I have not observed any ; I have seen them as early as July, when they destroy large numbers of aphides, particularly those which infest the leaves of the elm.

Turnstone, *Strepsilas interpres,* (Stonepecker). Abundant in winter, sometimes remaining as late as June. I have occasionly seen it almost all times of the year, and have very strong reasons for believing that it sometimes breeds in this island.

Sanderling, *Calidris arenaria.* Never common. Sometimes arrives as early as September. I have no reason to believe that they remain to breed, although I have shot them in June.

Heron, *Ardea cinerea,* (Haigrie). Plentiful in winter, arriving rather early. There can be no doubt that they sometimes breed in the high rocks.

Redshank, *Totanus calidris.* Although I have sometimes obtained the eggs, such instances are so uncommon that this species can scarcely claim a place anywhere but among the winter visitors.

Jack Snipe, *Scolopax gallinula.* A regular winter visitor. More numerous than was formerly supposed, the smallness of the number of snipe shooters in these islands having probably caused its presence to be overlooked.

Knot, *Tringa Canutus*. Tolerably numerous. I have seen them at all seasons, and in summer have obtained adult birds in brilliant chestnut plumage, as well as young ones barely fledged. Two eggs supposed to belong to this species were brought to me a few years ago. I had myself searched the spot, but unsuccessfully a short time previously, my suspicions having been excited by observing the birds in the immediate neighbourhood. The day after the eggs were taken both birds disappeared; the eggs closely resemble the figure in Mr. Morris's work, but are slightly darker.

Little Stint, *Tringa minuta*. Regularly visits us in winter, but in small numbers.

Purple Sandpiper, *Tringa maritima*. Very abundant in winter, and often remains until very late in spring. I strongly suspect that three eggs taken in the island of Hoonie belong to this species.

Water Rail, *Rallus aquaticus*. Lately ascertained to be a regular winter visitor, but by no means common.

Graylag Goose, *Anser ferus*. Bean Goose, *A. segetum*. and White-pointed Goose, *A. albifrons*. All visit us in winter, but usually in small numbers.

Brent Goose, *Anser bernicla*. Not uncommon in winter.

Widgeon, *Anas Penelope*. Regularly, but in no great numbers. In cold backward seasons I have several times procured the eggs.

Common Scoter, *Anas nigra*. Occasionally seen, but seldom obtained.

Longtailed Duck, *Anas glacialis*, (Calloo). Occurs on most parts of the coast, but very difficult to shoot.

Pochard, *Anas ferina*. Rather common upon the rocks, but less frequently met with upon salt water. Usually occurs in small parties.

Scaup Duck, *Anas marila*. Visits us regularly, but never, as far as I am aware, in very large flocks. Occasionally observed here in summer.

Tufted Duck, *Anas fuligula*. Not very plentiful. I have more than once seen it in summer, but there is nothing to prove that it ever breeds here.

Goldeneye, *Anas clangula*. Common. A few are nearly always to be seen here in summer, and eggs have been brought to me which precisely resemble those figured as belonging to this species.

Sclavonian Grebe, *Podiceps cornutus*. Although I have seen this bird almost every winter, it appears to be very uncommon.

Little Grebe, *Podiceps minor*. Not unfrequently met with in winter.

Great Northern Diver, *Colymbus glacialis*, (Immer goose). Common

in winter, but mostly seen after its arrival and immediately before the commencement of the breeding season. Some remarks as to the probability of its breeding here will be found in a recent number of the *Zoologist*, (p. 9525.)

Little Auk, *Uria alle*, (Rotchie). By no means common as a winter visitor.

Ivory Gull, *Larus eburneus.* Seen only in winter, and then but rarely.

Iceland Gull, *Larus lencopterus.* Of more frequent occurrence than the preceding species, yet far from common.

Glaucous Gull, *Larus glaucus.* Abundant in winter, and sometimes observed in very large flocks. Soon after their arrival the greater number of the old birds entirely disappear.

Pomerine Skua, *Lestris pomarina.* Rare, occurring only in winter.

IV.—PASSING VISITORS.

The nine species included under this head appear in autumn and spring, only resting with us for a short time on their way.

Shorteared Owl, *Strix brachyotus*, (Kat yogl, Gray owl). Autumn and spring, but in small numbers.

Fieldfare, *Turdus pilaris.* Very rarely seen in former years, but now visits us in large flocks, probably attracted by the shelter afforded by the gardens.

Redwing, *Turdus iliacus.* The remarks upon the preceding species may also be applied to the present one, only the former appears in much larger flocks ; both species seem to migrate only by night.

Ring Ouzel, *Turdus torquatus.* Altogether I have seen this bird in June, I have no proof it breeds here. Far from common.

Brambling, *Fringilla montifringilla.* Abundant in spring and autumn, but unknown as a visitor to these parts until I shot specimens in the garden at Halligarth, in 1859.

Curlew Sandpiper, *Tringa subarquata.* Small flocks appear early in autumn, but I can find no recorded instance of its occurrence in winter. A few make a short stay here on their way northwards in spring.

Hooper, *Cygnus musicus.* Autumn and spring in large flocks, seldom remaining for more than a few days, and then only with the apparent intention of resting from the fatigues of flight.

Bewick's Swan, *Cygnus minor.* Several years ago, I examined a species which had been killed at Haroldswick, and since that time I have ascertained it to be a regular visitor appearing at the same season as the hooper.

Pintail Duck, *Anas acuta.* So far as I am aware, this bird occurs only in autumn and spring, and then but sparingly.

MATERIALS FOR A FLORA OF WAKEFIELD AND ITS NEIGHBOURHOOD.

By T. W. Gissing.

(*Continued from page* 131.)

S. columbaria, L. Small Scabious. P. July—August. Glass Houghton and Hillam, (Mr. Roberts), Pontefract.

Knautia. *Linn.* Knautia.

K. arvensis, Coult. Field Knautia or Scabious. P. June—August. Common.

Order—COMPOSITÆ.

Tragopogon. *Linn.* Goat's-beard.

T. pratensis, L. Yellow Goat's-beard. B. June—July. Common.

Helminthia. *Juss.* Ox-tongue.

H. echioides, Gærtn. Bristly Ox-tongue. P. June—October. Lofthouse, (Mr. Robert.)

Apargia. *Schreb.* Hawkbit.

A. autumnalis. Willd. Autumnal Hawkbit. P. August—September. frequent.

Hypochœris. *Linn.* Cats-ear.

H. radicata, L. Long-rooted Cats-ear. P. July—September. Common.

Lactuca. *Linn.* Lettuce.

L. muralis, Less. Ivy leaved Lettuce. P. or B. June—August. Common.

Sonchus. *Linn.* Sow-thistle,

S. arvensis, L. Corn Sow-thistle. P. August. Common.

S. oleraceus, L. Common Sow-thistle. A. June—August—September. Common.

S. asper, Hoffm. Sharp-fringed Sow-thistle. A. June—August. Frequent.

Crepis. *Linn.* Hawk's-beard.

C. virens, L. Smooth Hawk's-beard. A. June—September. Frequent.

Leontodon. *Linn.* Dandelion.

L. Taraxacum, L. Common Dandelion. P. March—October. Common.

Hieracium. *Linn.* Hawkweed.

H. Pilosella, L. Common Mouse-ear Hawkweed. P. May—September. Heath, &c.

H. murorum, L. Wall Hawkweed. P. June—August. Frequent.

H. boreale, Fries. Broad-leaved Hawkweed. P. July—September. Frequent.

LAPSANA. *Linn.* Nipplewort.

L. communis, L. Common Nipplewort. A. July—September. Common.

ARCTIUM. *Linn.* Burdock.

A. Lappa, L. Common Burdock. B. July—September. Common.

CARDUUS. *Linn.* Thistle.

C. nutans, L. Musk Thistle. B. June—August. Heath—Garforth—Kippax, &c.

C. acanthoides, L. Welted Thistle. A. July—September. Pomfret—Norton—Smeaton, &c.

C. tenuiflorus, Curt. Slender flowered Thistle. A. or B. June—August. Frequent.

C. lanceolatus, L. Spear Thistle. B. July—September. Common.

C. palustris, L. Marsh Thistle. B. July—September. Common.

C. arvensis, Curt. Creeping Thistle. P. July—August. Common.

C. acaulis, L. Dwarf Thistle. P. July—September. Heath—Garforth, &c.

CARLINA. *Linn.* Carline Thistle.

C. vulgaris, L. Common Carline Thistle. B. July—September. Heath, Went Vale, Garforth, &c.

CENTAUREA. *Linn.* Knapweed, &c.

C. nigra, L. Black Knapweed. P. June—September. Common. A popular name of this plant is "Hard Heads."

C. Scabiosa, L. Greater Knapweed. P. July—September. Frequent.

C. Cyanus, L. Corn Blue Bottle. A. June—August. Warmfield and frequent on the limestone.

BIDENS. *Linn.* Bur-marigold.

B. cernua, D. Nodding Bur-marigold. A. July—September. Heath—Campsall—Sharlstone.

B. tripartita, L. Trifoliate Bur-marigold. A. July—September. By Stanley Canal.

EUPATORIUM, *Linn.* Hemp Agrimony,

E. cannabinum, L. Common Hemp Agrimony. P. July—September. Frequent.

TANACETUM. *Linn.* Tansy.

T. vulgare, L. Common Tansy. P. August—October. Common

ARTEMISIA. *Linn.* Wormwood—Mugwort.

A. vulgaris, L. Common Mugwort. P, July—September. Common.

A. Absinthium, L. Common Wormwood. P. August—September.—Sandal.

GNAPHALIUM. *Linn.* Cudweed.

G. sylvaticum, L. Highland Cudweed. P. July—September. Heath.

G. ulijinosum, L. Marsh Cudweed. A. July—September. Common.

FILAGO. *Linn.* Filago.

F. minima, Pers. Least Filago. A, June—September. Heath.

F. germanica, L. Common Filago. A. July—September. Common.

PETASITES. *Desf.* Butter-bur.

P. vulgaris, Desf. Common Butter-bur. P. March—April. Common. In some places flower stems five feet high, and leaves two feet wide.

TUSSILAGO. *Linn.* Colt's-foot.

T. Farfara, L. Colt's-foot. P. February—April. Common.

ERIGERON. *Linn.* Flea-bane.

E. acris, L. Blue Flea-bane. B. July—August. Garforth, Wentbridge, Knottingley.

SOLIDAGO. *Linn.* Golden-rod.

S. Virgaurea, L. Common Golden-rod. P. July—September. Common.

SENECIO. *Linn.* Groundsel, &c.

S. vulgaris, L. Common Groundsel. A. All the year round. Common.

S. sylvaticus, L. Mountain Groundsel. A. July—September. Heath, Ossett, Ardsley, &c.

Observations.

The *Inverness Courier* reports: "that the Earl of Cawdor recently shot a very curiously coloured grouse and sent it to Mr. Macleay, bird stuffer, Inverness, to be preserved. It is of a uniform pale ash colour nearly white, was in fine healthy condition. Another grouse was also sent to Mr. Macleay, the prevailing colour of which is a faded yellow, a few of the feathers being a light brown, the wings and tail ash coloured."

London Plants, Wimbledon Common:—See *Naturalist*, ii. 113. My friend Mr. Gamble informs me that he found *Drosera rotundifolia* last month growing plentifully in the bog under Cæsar's Camp; and that Mr. W. R. Tate has discovered *Epilobium angustifolium*, truly wild, in abundance by the plank bridge over the brook, in the bottom between Cæsar's Camp and Coombe Wood. These are two interesting additions to the present Botany of that district. —JAMES BRITTEN.

Birth of an Hippopotamus.—On the 1st of August last, the female Hippopotamus at the Zoological Gardens, Amsterdam, gave birth to a fine young male, which the authorities fortunately succeeded in getting away from the mother, without any harm being done to it. Latest advices announce that the little animal is in good health and condition, and rapidly increasing in size—*B.*

Reports of Societies.

High Wycombe Natural History Society.—On Saturday, August 26th, the members met for a field day, having chosen Hollow Lane for the purpose of exploration. Mr. Britten pointed out many of the floral beauties, and gave some interesting information concerning their names and reputed medicinal properties. Although many rarities have not boen found in the lane, the great profusion of flowers has attracted the notice of all who have rambled in it; the mulleins in particular being numerous and very fine, both *Verbascum nigrum* and *V. Thapsus*. The hedges are just beginning to revel in all their autumn luxuriance and beauty, the various colored fruits of the Mealy Guelder Rose, *Viburnum Lantana*, the Dogwood, *Cornus sanguinea*, the Black Bryony, *Tamus communis*, the Red Bryony, *Bryonia dioïcia*, the roses and the brambles all contributing their share. A paper on the origin of Hollow Lane, which had been prepared by the secretary, was read by Mr. E. J. Payne at the request of the writer, who was suffering from a severe cold. A short discussion then took place, and a vote of thanks was accorded to the writer of the paper, and after judging for themselves on the facts advanced by personal observation, the members separated, expressing themselves much pleased with the ramble, and regretting that more had not availed themselves of it.

Richmond and North Riding Naturalists' Field Club.—On Thursday, August 17th, the members of this Club to the number of about sixty held a Field Meeting at Bishop Auckland, and by the kind permission of Messrs. Stobart and Co. paid a visit to the Newton Cap Colliery near Bishop Auckland. Special carriages having been engaged, the party, of whom several were ladies left Richmond by the nine o'clock train reaching Bishop Auckland at eleven o'clock. After a brief stay at the Fleece Hotel, the party moved off for the colliery situate about a mile from the town; the ladies having preceded the rest in an open carriage. On approaching the place there were evident signs of holiday making, a number of the *employés* being put off work for the occasion; a royal salute of twenty-one guns was fired off, flags were displayed, one of which declared "Welcome to our Yorkshire friends," another the words "The Works of Nature lead the mind to Nature's God." After some little delay in arranging the attire, the descent took place under the able guidance of Mr. Lishman, the surveyor and agent. The "main" coal, the seam worked at Newton Cap Colliery is some 360 feet from the surface and the machinery for the descent is of the most perfect description, the shaft being large and the cages capable af accommodating eight or ten persons. In a short time the descent of the whole party was accomplished and being ushered into the "Drawing Room," a chamber at the foot of the shaft which had been whitewashed and seated, the visitors were each provided with a candle; they then divided into three parties each party having a conductor and visiting a different part of the pit—the ladies travelling along the cuttings in the small wood waggons used in these pits called "tubs"; (several new waggons having been made for the occasion,) these were drawn by the most tractable of ponies which seem to know every yard of the way; in many places the head room was so scanty—scarcely four feet high—that the occupants of the waggons had to stoop to avoid coming in contact with the ceiling. After staying some time at that portion of the pit where the men were hewing the coal, the party commenced a return and in due course arrived at the bottom of the shaft. One subject of remark during the journey, was the pure state of the atmosphere, the Davy lamp not being necessary in this pit, which is entirely attributable to the efficient state of arrangements for ventilation. The fur-

nace was the next point visited, and it certainly struck all with astonishment to see this large burning mass which was almost unapproachable ; within a few yards one incident attracted the attention of the ladies most particularly, a little kitten was observed dozing on the hearth as comfortably as though it was by the kitchen fire above ground. The next visit was made to the stables where the ponies and horses used in the workings are kept, each of these animals without a glimpse of the shining rays of the sun, seems the very embodiment of contentment. On leaving the stables the party bade good bye to the pitmen and ascended to *terra firma*, upwards of three hours having been spent in the pit. A sumptous cold collation was provided by the president of the club, at the Fleece Hotel to which sixty-six sat down. In the course of a speech proposing a vote of thanks to the owners of the colliery and to the gentlemen who had rendered such valuable assistance in conducting the excursionists through the pit, Mr. Wood entered into a most instructive account of the geological theory as regards the formation of coal fields, he dived most elaborately into the scientific value of coal, and its various products, showing beside its commercial value as the great lever which keeps our industrial engine in constant motion, it had in its various products become an important auxilary to the chemist who was able from the most repulsive looking of its refuse to distil the sweetest perfumes, and to eliminate from the same those brilliant colours which of late years have so much influenced the fashions, and the manufactures of the country. To Mr. Lushman, the chief-viewer, a gentleman to whom the party were mainly indebted for the excellent arrangements which had been made for securing the comfort of the excurionists, and more particularly for his attention to the safety of the Lady visitors, Mr. Wood, said they were under a debt of gratitude and he begged to couple his name with the toast. Mr. Lushman returned thanks and expressed the great pleasure he had had in carrying out the wishes of the owners of the colliery. Mr. John Bell, then proposed "the health of Mr. Wood, the president of the club," which was drunk with musical honours. Rev. J. Thompson of Easby proposed the health of Mr. E. Wood, junr., which was briefly responded to by that gentleman. The health of Mr. Duff was next drunk, the president remarking that to his exertions in clearing the way and making the preliminary arrangements, the success of the undertaking was mainly attributable. Mr. F. R. Gibbs, of Northallerton, then proposed the health of "the ladies" which was ably responded to by Mr. J. S. Walton, junr. After the president had announced that Mr. Lushman had promised to give them a copy of the plan of the pit for the museum, the company broke up and took their way to the railway station. On arriving at Darlington the interval from six to eight, was profitably spent at the Albert Hill Ironworks, which through the kindness of the managers were thrown open to the members of the club.—J. Aspdin, Secretary.

British Association for the Advancement of Science.

The proceedings of the thirty-fifth annual meeting of this Association commenced at Birmingham, on Wednesday evening, September 6th, when Professor Phillips, the president, delivered his inaugural address in the Town Hall, the side galleries and floor of which were filled with ladies and gentlemen in evening dress. The orchestra was filled by the members of council and of the several committees.

About eight o'clock Sir C. Lyell, the late president, took the chair amid much applause. He said it was then his duty to resign into the hands of his successor the office which he had the honour to hold for the last year. But before quitting the

chair he would take the opportunity of assuring them that he should always look back with pride and pleasure to having been thought worthy by them to be one of the presidents of the British Association. As he knew they were all impatient to hear the address, which Professor Phillips had prepared, he would not detain them any longer, but beg of him to take the chair.

Professor Phillips then delivered the address, which was frequently interrupted with hearty applause. On reading that portion referring to the labours of the late Captain Speke and Sir John Franklin, Professor Phillips was deeply moved. The address was an eloquent and complete *resumé* of the advancement of science in every department and contained the following reference to the Science of Zoology :—

"Ever since the days of Aristotle, the analogy existing among all parts of the animal kingdom, and in a general sense we may say among all the forms of life, has become more and more the subject of special study. Related as all living beings are to the element in which they move and breathe, to the mechanical energies of nature which they employ or resist, and to the molecular forces which penetrate and transform them, some general conformity of structure, some frequently recurring resemblance of function must be present, and cannot be overlooked. In the several classes this analogy grows stronger, and in the subdivisions of these classes real family affinity is recognised. In the smallest divisions which have this family relation to the highest degree, there seems to be a line which circumscribes each group, within which variations occur, from food, exercise, climate, and transmitted peculiarities. Often one specific group approaches another, or several others, and a question arises whether, though now distinct, or rather distinguishable, they always have been so from their beginning, or will be always so until their disappearance.

"Whether what we call species are so many original creations or derivations from a few types or one type, is discussed at length in the elegant treatise of Darwin, himself a naturalist of eminent rank. It had been often discussed before. Nor will any one think lightly of such enquiries, who remembers the essays of Linnæus, "*De Telluris orbis incremento*," or the investigations of Brown, Pritchard, Forbes, Agassiz, and Hooker regarding the local origin of different species, genera, and families of plants and animals, both on the land and in the sea. Still less will he be disposed to undervalue its importance, when he reflects on the many successive races of living forms more ar less resembling our existing quadrupeds, reptiles, fishes, and mollusca, which appear to have occupied definite and different parts of the depths of ancient time; as now the tiger and the jaguar, the cayman and the gavial, live on different parts of the terrestrial surface. Is the living elephant of Ceylon the lineal descendant of that mammoth which roamed over Siberia and Europe and North America, or of one of those sub-Himalayan tribes which Dr. Falconer has made known, or was it a species dwelling only in circumpolar regions? Can our domestic cattle, horses and dogs, our beasts of chase and our beasts of prey, be traced back to their source in older types, contemporaries of the urus, megaceros, and hyæna on the plains of Europe? If so, what range of variation in structure does it indicate? If not so, by what characters are the living races separated from those of earlier date?

"Specific questions of this kind must be answered, before the general proposition, that the forms of life are indefinitely variable with time and circumstance, can be even examined by the light of adequate evidence. That such evidence will be gathered and rightly interpreted I for one neither doubt nor fear; nor will any be too hasty in adopting extreme opinions, or too fearful of the final result, who re-

member how often that which is true has been found very different from that which was plausible, and how out of the nettles of danger we have plucked the flowers of safety. At the present moment the three propositions which were ever present to the mind of Edward Forbes may be successively maintained, as agreeing with many observed phænomena ; and around them as a basis of classification may be gathered most of the facts and most of the speculations which relate to the history of life. First, it may be admitted that plants and animals form many natural groups the members of which have several common characters, and are parted from other groups by a real boundary line, or rather unoccupied space. Next, that each of these groups has a limited distribution in space, often restrained by high mountains or deep seas, or parallels of temperature, within which it has been brought into being. Thirdly, that each group has been submitted to, or is now undergoing, the pressure of a general law, by which its duration is limited in geological time ; the same group never re-appearing after being removed from the series.

PROCEEDINGS OF SECTION D.—ZOOLOGY AND BOTANY.

The President of this section, D. T. Thomson, M.D., in his opening remarks, regretted the inability of Sir John Lubbock to fill the place, the more, as he had hitherto had so few opportunities of making himself thoroughly acquainted with the subjects they would have to discuss.

Mr. J. Gwyn Jeffreys, F.R.S., was then called upon to read a report on "Dredging in the Channel Islands, *Mollusca.*"

Mr. Jeffreys prefaced the reading of his report by alluding to the remarks of the president of the association in his inaugural address in the Town Hall as to the importance of Dredging ; and the results arrived at therefrom. The expedition which he had conducted had received valuable assistance from the Rev. A Merle Norman and Mr. Ray Lancaster, and had proved very interesting notwithstanding the difficulties encountered in consequence of the rocky nature of the sea bed in those parts ; the Mollusca of this district resembled generally those of the Mediterranean, but not more than four hundred different species were to be found here. Comparing the Channel Islands with the Shetland Isles, examined last year, he found that there were some eighty specimens to be found in the Channel Islands not common to the Shetland Islands, while there were some sixty specimens to be found round the Shetland Islands not present in the neighbourhood of the Channel Islands, leaving 360 species common to both. The depth of water was found to be not more than thirty fathoms, being some sixty fathoms shallower than near the Shetland Isles. Several species were specially noticed. A *Cerithium vulgatum* was dredged off Jersey. This is a Mediterranean shell, and has not been observed or recorded from any part of the North Atlantic. Mr. Jeffreys considered the discovery of this species on the Channel Isles as indicative of, if not proving, the submergence of this part of the sea bed within a comparatively recent period, perhaps during the historical.

Mr. M'Andrew being called upon, considered that the report read by Mr. Jeffreys threw considerable light upon the question of distribution, but doubted whether the *Cerithium vulgatum* was ever found alive north of Cape Vincent. He had found it in the Mediterranean in very deep water, which should be noted as a new point.

MARINE FAUNA OF THE CHANNEL ISLANDS.

The Rev. A. Merle Norman, A.M., being called upon to read the report of the committee appointed to investigate the Marine Fauna of the Channel Islands, remarked that he laboured under considerable disadvantage on account of the expedition being unprovided with the necessary microscopes and books. The Marine Fauna, upon which he had to report, re-

quired the most minute microscopic examination, and therefore his present report could not be as full and exhaustive for the reason explained as he should wish. Among other specimens, he had discovered one of the long-armed lobster tribe, *Galathea Andrewsei* much larger in size than was at all usual, one of the claws of which was most extraordinarily developed. Mr. Norman then called particular attention to the *Artemia salina*, discovered in the salt pans of Guernsey, and to the fact of its being only found in highly impregnated brine, and not in the water of the open sea. The question as to how it made its way from one salt pan to another, and where lay the origin of the species, was peculiarly interesting.

Mr. Spence Bate offered a few remarks referring to the well-shrimp, which is to be found in wells only a year or two old, whereas natural springs were quite free from it.

Mr. J. Gwyn Jeffreys, F.R.S., read his report "On Dredging on the coast of Aberdeen."

Mr. W. R. Hughes, F.L.S., being called upon next, read "Notes on the Development of a Deep Sea Sponge in a Marine Aquarium," in which he called attention to the great practical value of aquaria in connexion with Marine Zoology, as proved by the instance in question. There could be no question of its practical utility in the study of similar phenomena, and the way in which it demonstrated the possibility of keeping deep sea specimens for a considerable length of time. The usual locality of *Halichondria suberea* (Dr. Johnson), *Hymeniacidon suberea* (Dr. Bowerbank), is, according to Dr. Bowerbank, "on shells seven to ten fathoms under water"; he had never known it develop itself in a vivarium before.

William Hinds, M.D., read a paper "On the identity of Origin of Starch and Chlorophyll," in which he demonstrated that the green of nature represents so much amylaceous matter, which, when used as food, is convertible into animal nutriment. Starch, chlorized or unchlorized, is so universal that nearly all the green of vegetation represents so much starch distributed through the exposed tissue of plants, and is, whether in a green or dried state (like hay), nutritious in proportion to the starch it contains. The conclusion he arrived at from his examination of starch and chlorophyll, was that their origin was fundamentally similar; the exposure to light made the principal difference in their appearance.

The Rev. A. W. McKay read a paper "On *Turdus migratorius*, showing its resemblance to the thrushes of this country.

Mr. H. T. Stainton, F.L.S., read a short paper "On the extraordinary partiality shown by insects of the genus *Laverna* for plants of the order *Onagraceæ*." The author called attention to the singular fact that out of the limited number of eighteen species of which the genus *Laverna* consisted, no less than ten should derive their nourishment when in the larva state from plants of the family *Onagraceæ*, nor was this a simple case of a different species feeding on a different species of plant, for several species fed on the same plant though in different ways. Thus on *Epilobium angustifolium* three larvæ occurred, one in the root, one in the terminal shoot, and one in the leaves. On *Epilobium hirsutum* five larvæ occurred, one in the root, one in the terminal shoot, and three in the leaves. Again *Epilobium montanum* was fed on by two species of *Laverna*, but they fed differently from any of the preceding species. One, *L. decorella*, making a gall in the stem, and feeding in the seed pods. The fact was the more curious that the remaining species of the genus *Laverna* fed on plants of a very different kind.

S. Moffatt, M.D. F.G.S., then read an interesting paper on "Phosphorescence in connection with Storms and Disease." His remarks were of a statistical character, bearing chiefly upon the luminosity of phosphorus under certain states of the atmosphere.

This paper concluded the labours of Section D for the day.

(To be Continued.)

Richmond and North Riding Naturalists' Field Club.—Monthly meeting, Tuesday, September 12th.

Mr. James Ward, F.B.S., in the chair.

The chairman exhibited a quantity of plants collected at Waitwith and Bolton-on-Swale, amongst which were *Bartsia odontites*, *Potamogeton natans*, *Sparganium ramosum*, *Veronica scutellata*, *Hydrocotyle vulgaris*, *Erythræa pulchella*, *Juncus lamprocarpus*, *Callitriche verna*, var., *platycarpa*, *Nasturtium terrestre*, *Bidens cernua*, and var., *radiata*, *Chenopodium glaucum*, *Ranunculus sceleratus*, *Limosella aquatica*, and *Verbena officinalis*.

Mr. E. Wood, Jun., exhibited some interesting specimens of iron planings from armour plates manufactured at the Atlas Works, Sheffield.

The secretary (Mr. J. Aspdin) exhibited a specimen of the common viper, *Pelias Berus*, taken near Richmond in June last.

Mr. J. Richardson exhibited some specimens of lead and copper ores from Merry Bent, near Richmond.

After the election of some new members the meeting adjourned to the second Tuesday in October.—J. Aspdin, Sec.

Manchester Scientific Students' Association : 2nd September, 1865.—On this day the members of the above association made their usual fortnightly excursion, the locality selected being Reed Mere, four miles distant from Alderley on the Congleton road.

After passing the village of Chorley the road slightly rises, and a short distance along it there opens cut a commanding prospect of the fertile plains of Cheshire, the distant hills of North Wales forming an appropriate background. From this plain a couple of rocky eminences rise abruptly, one being crowned by the modern structure of Peckferton Castle, the other bearing the ruins of Beeston Castle, and at their base Delamere forest is plainly visible to the left. The road bordered on either side by fine timber trees—the Spanish chesnuts being especially noticeable from their wealth of fruit,—continues along the boundary of Lord Stanley's grounds, and soon after crossing the Macclesfield road the party came in sight of Reed Mere. Near the point where the high roads intersect, a tumulus was noticed with some interest, from the comparative rarity of such remains near Manchester ; the mound is readily identified by the two fir trees which grow on its summit. On arriving at the lake the members broke up into parties of exploration, their attention for the most part being given to the vegetation which grows in the lake and at its edge. This sheet of water is sometimes called Capesthorne mere, Capesthorne Hall being in the immediate neighbourhood, and it is remarkable for its large floating island, and for the innumerable white water lilies which mantle its surface.

The following plants were among those collected on the occasion :—*Nymphæa alba*, *Nuphar lutea*, *Ranunculus divaricatus*, *Myriophyllum spicatum*, *M. verticillatum*, *Scirpus lacustris*, *Calamagrostis Epigejos*, *Hippuris vulgaris*, &c. The latter plant was viewed with especial interest as it is not known to occur within the limits of the Manchester Flora.—J. W. Hatton, Ash Lodge, Old Trafford, September 25th, 1865.

Obituary.

Samuel P. Woodward, Ph. D., A.L.S. Assistant Palæontologist in the British Museum, died July 11th, 1865, from the effects of a severe attack of Bronchitis. He was born 17th September, 1821, and was second son of the late Samuel Woodward, of Norwich, a gentleman well known to geologists and antiquaries.

Mr. S. P. Woodward was the author of a "Manual of Recent and Fossil Shells," and contributed many important papers to the scientific publications of the day.

Although his published works may appear to be small, they represent only a portion of the original work that he performed; many of the results he arrived at must have died with him, but others remain in the form of carefully prepared manuscripts, which his brothers entertain the hope of publishing. It may be a matter of surprise that he did so little in making known the results of his investigations; but for the last twenty years of his life he suffered from chronic asthma, which eventually became so distressing as to awaken the sympathies of all, and caused many to marvel at the energy he displayed in research and conversation during intervals of release from pain.

Observations.

Tongue of a Toad.—Fifteen months ago Mr. Gamble gave us an account of a cock cherishing feelings of revenge, I have found that my toads and frogs sometimes entertain a similar passion, though the peculiarity is not like the cock, in the length of time for which they retain the feeling, but in the instrument with which they give vent to it, viz. :—the tongue. When angry they hit one another with their sling-like tongues; which, being so to speak, loaded at the end, must be rather formidable weapons.—W. R. Tate, 4, Grove Place, Denmark Hill, London.

Flight of Migrants.—Shortly after daybreak this morning a grand migration of Swallows and Meadow Pipits passed over the ship, all flying steadily in a south-easterly direction. This flight continued until past ten o'clock and then gradually ceased. Sometimes there were many hundreds of birds visible at once, and at others perhaps not more than a dozen. The Meadow Pipits flew high, in little companies of five or six, and constantly uttered their sharp "tweet, tweet." The greater part of the swallows also flew high, although a few of them skimmed the surface of the sea, as if feeding as they flew. It was a delightful morning, and so calm and unruffled was the sea, that it appeared, if one may use the expression, as if it still slept. With these birds I also noticed two small families of wagtails; at ten o'clock a solitary bird approached and seemed attracted by the ship, as it flew several times backwards and forwards between the masts as if hesitating whether or not to alight on one of the yards. The note of this bird was a peculiar one and entirely puzzled me, although I flatter myself I am pretty well acquainted with the notes of most of our British birds. The only bird I can in anyway compare its note, flight, or size to, is that rarity, *Anthus Richardi.*—G. F. Mathews, Assistant Paymaster, R.N., F.L.S., Memb. Ent. Soc: London, H.M.S. Terrible, Spithead, 17th September, 1865.

Small specimen of P. Napi.—I took an exceedingly small example of the above insect while on a stay at Torquay, Devonshire.—I give the incidents of my capture as briefly as possible :—Rambling, net in hand, down one of those green lanes for which Devonshire is so remarkable, I suddenly came to a damp, marshy piece of ground, caused by the overflow of a stream of water, and there I observed a small white butterfly going through its gyrations, and occasionally settling to sip the moisture. On account of the locality, and the size of the insect I at once set it down to be the white variety of *P. Phlæas*, mentioned by Mr. Newman in his "*Butterflies*," as being of common occurrence on the Continent, but scarce in England, and fancied I had come across a rarity. After a succession of twirls and misses I at last got the supposed prize safely in the net, when, to my astonishment and I may say chagrin, I saw it was not a Copper but a Green Veined White. On account of its unusually small size (measuring about one inch four lines from tip to tip of wings when expanded) I set it and gave it a place in my cabinet, where I regard it, if not as a *rarity*, certainly as a *curiosity*.—F. Wilkinson, Stamp Office, Market Harborough, September 8th, 1865.

Geological discoveries at the Hoyle's Mouth Cavern.—We have been informed that two gentlemen visiting Tenby have recently found in the "Oyle" or "Hoyle" cavern some interesting remains of extinct and other animals.

In the chamber which is at present the furthest accessible part of the cavern, they found in a mass of breccia a large part of the bones of the hind quarters of the Great Cave Bear, which they extracted in a very perfect state; near these were some remains of *Hyœna Spelœa* and several loose bones and teeth of Fox, Deer and Ox. In the passage, about forty feet from these, were found the bones and teeth of Hyæna, Fox, Deer, and Goat, also the bones of a large bird, and what is especially interesting—a worked flint. All these were below the level of the old hard stalagmitic floor, and therefore contemporary with the epoch called *Pleistocene*—in fact, of the period of the *Mammoth*. It is remarkable that in this cave there is evidence, that during a portion of this period, the sea had access to the interior, as the bones were accompanied both below and above them, by pebbles of various rocks, exactly resembling those on the sea shore, and on parts of the sides are to be found deposits of sea shells, covered with a thin coat of stalagmite, exactly in the positions such animals would have lived in.

At the entrance excavations were made by these gentlemen, in consort with our respected neighbour, the Rev. G. N. Smith, of Gumfreston.

A large number of worked flints were discovered, and in a layer that there is every reason to believe was perfectly free from previous disturbance, among them was found the upper molar of the *Megaceros* or Great Irish Elk—an animal strictly the contemporary of the Great Cave Bear, the canine tooth of which had some time since been discovered in the same place, similarly associated, by Mr. Smith.

Some of these worked stones were not exactly flint, but of a stone not at present known to our informants. It is a semi-vitrified trap, or semi-obsidian, of a dull green colour, with whitish specks, and translucent at the edges, having precisely the same fracture as flint.

There were also discovered, at a level below that of the old stalagmitic floor, and directly under a shelf of it, about thirty-five feet from the entrance of the cave, a part of the lower jaw and the heel bone of a man. These remains may be of the date of the worked flints; but they were so placed that they may have been of any date greater than a few hundred years since.—*Tenby Observer.*

Exchange.

Lepidoptera.—I have duplicates of these insects for exchange in good condition. *G. rhamni, C. Edusa, A. Paphia A. Adippe, A. Euphrosyne, V. Cardui, A. Galathea, S. Semele, L. quercus, L. œgestis, L. Corydon, L. Alsus, L. Argiolus, S. alveolus, H. Actœon,* (taken at Lulworth Cove in July,) *M. stellatarum, Z. filipendulœ, C. miniata, L. dispar,* (bred) *E. lanestris,* (bred), *B. quercus, O. sambucata, P. cytisaria, H. thymiaria, C. pusaria, L. adustata, C. prunata, E. bipuntaria, L. impura, L. pallens, X. polyodon, H. popularis, T. gothica,* and pupæ of *P. Bucephala,* I shall be glad to receive a list of duplicates from any one who wishes to exchange. I require besides *many* others. *C. Hyale, A. iris, V. Antiopa, G. C-album, A. Aglaja, T. betulæ, L. Arion, L. paniscus,* any of the Hawk moths, except *ligustris* and *stellatarum, L. monacha, A. vellica, L. trifolii, E. versicolora, C. Haworthii.*—Miss Ellen Dibben, Critchill, Wimborne, Dorset, September 1st.

Original Articles.

CATALOGUE OF THE BIRDS OF SHETLAND.

By Henry L. Saxby, M.D.

(*Continued from page* 146.)

V.—OCCASIONAL VISITORS.

Seventy-eight species.

Golden Eagle, *Falco chrysaëtos.* Although this noble bird is reputed still to breed here, I regret that the testimony of competent observers compels me to place it in the list of occasional visitors. Although constantly upon the watch, I have never obtained even a glimpse of it.

Osprey, *F. haliæëtus.* Not unfrequently seen, although very seldom obtained.

Hobby, *F. subbuteo.* Very rare. Seems to occur in autumn only. It is said to be of frequent occurrence, but the inhabitants of these islands are quite unable to point out the distinction between it and the merlin.

Goshawk, *F. palumbarius.* The only specimen known to have occurred here is now in my possession. It was shot at Scaw in the winter of 1860-61. In many parts of Shetland the peregrine is called the goshawk.

Kite, *F. milvus.* Has not been seen for many years.

Buzzard, *F. buteo.* Rare.

Honey Buzzard, *F. apivorus.* A specimen occurred in 1862, and is now in my possession.

Marsh Harrier, *F. æruginosus.* Stragglers have been met with at all seasons, but I have no doubt that *F. cyaneus* has frequently been mistaken for it.

Eagle Owl, *Strix bubo.* Now very rarely seen.

Barn Owl, *Strix flammea*, and Tawny Owl, *S. aluco*, have both been seen by Dr. Edmondston.

Hawk Owl, *S. ulula.* This rare species has been twice observed. The skin of one which was shot five years ago in the north of Unst is now in my possession.

Missel Thrush, *Turdus viscivorus.* Very rarely seen.

Song Thrush, *T. musicus.* A straggler now and then appears in the gardens.

Robin Redbreast, *Sylvia rubecula.* Very few instances of the occurrence of this species have come under my notice. Shetlanders assert that it is common here, but they almost invariably mean the wren, which they call by the same name.

Redstart, *S. phœnicurus.* One, a male, seen at Baltasound October 16th, 1860, and another, apparently a young bird, on the 16th of the present month (July).

Blackcap, *S. atricapilla.* Occasionally appears for a few days.

Garden Warbler, *S. hortensis.* One seen at Baltasound, September 30th, 1861.

Whitethroat, *S. cinerea.* Rare, but sometimes heard as well as seen.

Lesser Whitethroat, *S. curruca.* Has been seen by me on several occasions.

Willow Wren, *S. trochilus.* Scarcely a summer occurs without one or two making their appearance, but they never breed here.

Chiffchaff, *S. rufa.* Rare. Last year I saw one as late as the 21st of November.

Great Titmouse, *Parus major*, Blue Titmouse, *P. cœruleus*, and Long-tailed Titmouse, *P. caudatus.* Although all have been seen here they are of extremely rare occurrence.

White Wagtail, *Motacilla alba.* I saw a pair near Lerwick eleven years ago, but am not aware of its occurrence since.

Pied Wagtail, *M. Yarrellii.* Although occasionally observed in summer it never breeds here.

Gray Wagtail, *M. boarula.* A few sometimes visit us in August and September.

Greyheaded Wagtail, *M. flava*, has been observed late in autumn.

Blackheaded Bunting, *Emberiza schœniclus*, and Yellowhammer, *E. citrinella*, have been observed upon several occasions.

Greenfinch, *Fringilla chloris.* Only one instance of its occurrence had been observed until the 28th of last October, when a heavy gale from N.E. brought over some enormous flocks.

Siskin, *F. spinus.* Very seldom seen, and as far as I am aware in winter only.

Bullfinch, *Loxia pyrrhula.* An adult female was shot by me at Baltasound, in October 1863. No other example has been recorded.

Rosecoloured Pastor, *Pastor roseus.* I have shot two specimens at Baltasound, one, a second year's male, on the 10th of August, 1860, the other also a male, but apparently a young one, early in September, 1863.

Crow, *Corvus corone*, Rook, *C. frugilegus*, Jackdaw, *C. monedula.* Occasionally visit us, but never remain many days.

Jay, *C. glandarius.* I have only observed it once, and can hear of no other instance of its appearance.

Spotted Woodpecker, *Picus major.* Unknown here until September, 1861, when great numbers arrived at Unst with a steady breeze from S.E. I afterwards heard of them in various parts of Shetland, as well as in Orkney, and several communications to the *Zoologist* about that time bear testimony to the unusually large numbers which then visited the English coast. I examined many specimens ; the first was an adult male, but all the others were apparently young males of the year.

Hoopoe, *Upupa epops.* Occasionally appears in autumn.

Cuckoo, *Cuculus canorus.* Rare, but I have good reason for believing that it has bred here.

Roller, *Coracias garrula.* This beautiful species is mentioned by Mr. Morris, (British Birds, vol i. p. 278,) as having once occurred here.

Swallow, *Hirundo rustica.* Although several instances of its breeding here have occurred, it appears only in such very small numbers and at intervals so uncertain that I still class it with the occasional visitors.

Martin, *H. urbica.* Also an occasional visitor. It breeds in Orkney, and also it is said, in Faroe.

Sand Martin, *H. riparia.* Very rare.

Swift, *Cypselus apus.* Small parties sometimes appear in autumn.

Nightjar, *Caprimulgus europœus.* Very rarely seen.

Ring Dove, *Columba palumbus.* I have occasionally seen one here after high winds from S.W. or S.E.

Turtle Dove, *C. turtur.* Has been obtained upon three occasions in Unst, but, so far as I am aware, has not been seen in any other part of Shetland.

Pallas' Sand Grouse, *Syrrhaptes paradoxus.* In October, 1863, several of these strange birds appeared in Unst with a steady breeze from S.E., and I succeeded in shooting one, a female in perfect plumage.

Pratincole, *Glareola torquata.* One was shot at Baltasound by Mr. Bullock, in 1812, but no other example has occurred.

Gray Plover, *Vanellus melanogaster.* Now very seldom seen.

Crane, *Grus cinerea.* Dr. Fleming records the occurrence of a small flock in 1807, Mr. Wolley one example in 1848, and Mr. Dunn, two in 1832. To these instances I am happy to be able to add that a specimen was

shot by my brother-in-law, Mr. Thomas Edmondston, junr., and myself no further back than last week. Another was killed at Haroldswick some weeks previously, and was purchased by Mr. Thomas Edmondston of Buness, who sent it south to be stuffed.

Bittern, *Ardea stellaris*. Very rare.

Little Bittern, *A. minuta*. Observed in Unst many winters ago by Dr. Edmondston.

White Stork, *Ciconia alba*. Has undoubtedly occurred more than once.

Spoonbill, *Platalea leucorodia*. Has been shot here, but it is extremely rare.

Glossy Ibis, *Ibis falcinellus*. In October, 1862, an immature specimen was shot in a corn-yard at Baltasound.

Common Sandpiper, *Totanus hypoleucos*. Unknown as a visitor to these parts until the summer of 1860, when several were observed in Unst, by Mr. Crotch. I have since met with it in summer in the neighbourhood of the Loch of Cliff.

Greenshank, *T. glottis*. Too uncommon to be considered a regular visitor, although small flocks sometimes occur.

Avocet, *Recurvirostra avocetta*. Has not been seen for many years.

Bartailed Godwit, *Limosa rufa*. Rare.

Woodcock, *Scolopax rusticola*. Rare in the North Isles, but more frequently met with in the neighbourhood of Lerwick.

Coot, *Fulica atra*. Occasionally met with in winter.

Gray Phalarope, *Phalaropus platyrhynchus*. One shot in Unst by Mr. Crotch in the autumn of 1860.

Rednecked Phalarope, *P. hyperboreus*. A pair shot at Unst on the 6th of July, 1864.

Bernicle Goose, *Anser leucopsis*. I saw one at Baltasound in the summer of 1864, but can hear of no other instance of its occurrence.

Common Shieldrake, *Anas tadorna*. Very rare.

Garganey, *A. querquedula*. I have shot this species in September, but it is very uncommon.

King Duck, *A. spectabilis*. Stated by Macgillivray to have occurred here.

Velvet Scoter, *A. fusca*, and Surf Scoter, *A. perspicillata*, not unfrequently appear in winter.

Goosander, *Merygus merganser*. Extremely rare here, although breeding in Orkney.

Rednecked Grebe, *Podiceps rubricollis.* One was found dead upon the shore at Hammer in February, 1861.

Gannet, *Sula bassana.* Although a few sometimes remain during the winter, the appearance of this bird is so uncertain that it can only be considered an occasional visitor.

Wedgetailed Gull, *Larus Rossii.* In the summer of 1854, I shot a gull, which, although unknown to me at the time, and unfortunately lost, was without doubt an example of this rare species. Its description and measurement are still in the note book which I carried at the time.

Sabine's Gull, *L. Sabini.* Two examples have occurred to my knowledge.

SUMMARY OF THE BIRDS OF SHETLAND.

Resident Visitors	6	9	1	5	12	=	33
Migrant Natives	0	2	0	4	11	=	17
Winter Visitors	2	7	0	9	19	=	37
Passing visitors	1	4	0	1	3	=	9
Occasional Visitors	12	36	3	16	11	=	78
	21	58	4	35	56	=	174

Baltasound, Shetland, August 2nd, 1865.

NOTES ON THE COMMON GARDEN SNAIL.

(*Helix aspersa.*)

By Thomas Graham Ponton.

However common an animal may be, I believe that there are generally some minute particulars in its habits and economy which will be found to repay investigation.

It was this belief which induced me to breed and keep in captivity a common garden snail, and to make some investigations into its habits, the results of which are now laid before the reader—None of the facts given are probably altogether new, but some of them may perhaps be unknown, and prove of interest to the readers of the *Naturalist.*

First, then with regard to its *temperature*. This is exceedingly variable, so that no certain rule can be laid down with regard to it. From the mean of several observations, the temperature would appear to be equal or nearly so at all seasons, varying generally both in summer and winter, from about to two degrees higher than the temperature of the air, and sometimes two degrees lower. I have however never found it either higher or lower than these two extremes.

After its winter fast, during spring and the early part of summer, the snail has a curious propensity for gorging itself. The quantity eaten at a meal during this period, varies from six to nine or ten grains, the usual quantity being about eight grains, or half the weight of the animal exclusive of its shell. At this time it usually fasts from five to seven days after each meal, and this although fresh food is constantly supplied. On one occasion it fasted as long as nine days, after this fast it gorged itself to such an extent as to be unable to withdraw into its shell, but lay in a helpless state at the bottom of the jar in which it was kept, for about ten hours. This habit of gorging however, only lasts about two or three months. After that the quantity of food consumed, is pretty constant during the remainder of the summer. It is much less in quantity than during the spring, being only about five grains or a third of its own weight exclusive of the shell ; it usually only eats every other day. In the selection of its food the snail is a bit of an epicure, it is very partial to lettuce and cabbage, but if supplied with both it will eat the lettuce in preference to the cabbage, doubtless from its being more aromatic ; the leaves of nasturtium it is also particularly fond of, hop leaves it likewise greatly affects, but mint, laurel, mustard, and sweet briar, it wont touch, mustard especially being held in abhorrence.

One day my snail escaped, and fell off the table, breaking its shell in the fall. I had thus a good opportunity of observing its power of repairing injuries. After being placed in confinement it immediately fixed itself on the side of the jar, next day I perceived that a thin pellicle of calcareous matter had formed over the bare surface, and in a week this became slightly coloured, and within a month the part was entirely restored.

The pace of the snail is proverbially slow, on calculation I found that its rate of progression was usually about a yard in twelve minutes, being nearly seventeen hundred and sixty times slower than that of a man.

Dr. Bell observes, with regard to the hybernation of the snail, that it usually begins about the beginning or middle of October. Both this year and last mine began to hybernate about the middle of September. This difference of

time in hybernation however doubtless arises from confinement or other circumstances.

With regard to the hybernation of my specimen, there is a curious instance of adaptation to circumstances or rather of undeveloped instinct. It has never, not even during the first winter after birth, formed a nest of leaves and earth as is usual with snails, although it has been supplied with the necessary materials. It contents itself with merely fastening itself on the side of the glass jar, and although it usually remains torpid for about six or seven months it never forms a pseudo-operculum. The reason of this doubtless is that being kept in a warm room, it is unnecessary that it should be covered up as a protection against cold, and therefore the instinct which under ordinary circumstances teaches it to do so remains undeveloped.

ENTOMOLOGICAL NOTES IN 1865.

By F. Buchanan White, M.D.

Most Lepidopterists will agree, I think, in considering the season 1865, a great improvement on the three or four preceding years. One butterfly *Vanessa cardui*, which had not been captured or perhaps even observed in this district (Perth) for a number of years, has appeared this season in no few numbers, it seems to be widely distributed, as I traced it from the head of Ben Lawers in Breadalbane, down to the sea level on the coast of Fife. *Lycæna artaxerxes* as usual, has been abundant. Another feature of this season has been the occurrence of numerous specimens, both larvæ, pupæ, and imagos of *Acherontia atropos.*

Sphinx convolvuli has just put in an appearance, and will no doubt again be found, as it occurs here nearly every year. *Chœrocampa celerio*, (as already recorded in the *Naturalist*), has paid a second visit to Perth, being found in the very heart of the "Fair City."

Its less prized cousin, *C. porcellus*, and *Macroglossa Stellatarum*, have been very common, one collector having found upwards of one hundred larvæ of the former.

Deilophila galii, which condescended to be captured here some years ago, has *not* this year been found as might have been expected.

Euchelia Jacobeæ, so rare in Scotland, has been found in Forfarshire, (vide. p. 116), and again at Largo in Fife.

Larentia ruficinciata, I took on Maol Ghyrdhy, between Glen Lyon and Glen Lochay. *Dicranura vinula*, and *D. furcula*, usually not common in this district, have been far from rare. At Largo in Fife, *Charœas graminis Agrotis valligera*, and *A. aquilina*, *Luperina testacea*, and *Miana literosa*, were common, while a few examples of *Celœna Haworthii* and one of *Cirrœdia Xerampelina*, turned up. Largo is thus a new station for the local *Xerampelina*.

Hadena rectilinia, was found by Mr. Stewart *in* Perth.

Dasypolia templi, was taken by me on a lamp on September 18th. This insect as far as I am aware has not before been found in Scotland, and is consequently an addition to the Fauna of this part of Britain. I should be obliged by any one informing me if I am mistaken.

I found one specimen of *Scopula alpinalis*, in the Breadalbane district.

MATERIALS FOR A FLORA OF WAKEFIELD AND ITS NEIGHBOURHOOD.

By T. W. Gissing.

(Continued from page 149.*)*

S. Jacobœa, L. Common Ragwort. P. July—October. Common.

S. aquaticus, Huds. Marsh Ragwort. P. July—October. Common.

Doronicum. *Linn.* Leopard's Bane.

D. Pardalianches, L. Great Leopard's-bane. P. May—July. Near Soothill Wood, (Mr. Smith).

Inula. *Linn.* Inula.

I. Conyza, D.C. Ploughman's Spikenard. B. August—October. Near Pontefract.

Pulicaria. *Gaertn.* Flea-bane.

P. dysenterica, Gaert. Common Flea-bane. P. July—September. Frequent. When green often has a very strong smell, like Black Currant leaves.

Bellis. *Linn.* Daisy.

B. perennis, L. Common Daisy. P. Abundant from February to October, and may often be seen in flower in every month of the year. Common.

Chrysanthemum. *Linn.* Ox-eye.

C. Leucanthemum, L. Great White Ox-eye or Mayweed. P. May—August. Common. In some parts a belief prevails that rubbing the

eyes with this plant causes blindness—consequently children are not allowed to pluck it—The same notion exists about the Red Poppy. It is sometimes found with the ray-florets tubular.

C. segetum, L. Corn Marigold, or Yellow Ox-eye. A. June September. Warmfield—Pontefract.

C. Parthenium, Pers. Fever-few. P. May—September. Frequent but always a garden escape.

C. inodorum, L. Scentless Fever-few. A. Frequently in flower all the year. Common. Found at Warmfield with the ray florets double.

MATRICARIA. *Linn.* Wild Chamomile.

M. Chamomilla, L. Wild Chamomile. A. June—August. Frequent.

ANTHEMIS. *Linn.* Chamomile.

A. Cotula, L. Stinking Chamomile. A. June—September. Frequent.

ACHILLEA. *Linn.* Yarrow. Milfoil.

A. Ptarmica, L. Sneezewort Yarrow. P. July—September. Frequent.

A. Millefolium, L. Common Yarrow, or Milfoil. P. June—September. Common. In some of the eastern counties, there is a rough rhyme giving to this plant some mystical powers over lovers.

ORDER—CAMPANULACEÆ.

CAMPANULA. *Linn.* Bell-flower.

C. rotundifolia, L. Hair-bell. P. July—October. Frequent. From the general gracefulness of the plant and the *hair*-like thinness of the flower stalks on which the *bells* swing, I prefer the name *hair*-bell to the commoner (and altogether unexplainable) *Hare*-bell. To show the delicacy of the plant, Sir Walter Scott says,—

> " E'en the slight *Hairbell* raised its head,
> Elastic from her airy tread."

C. latifolia, L. Giant Bell-flower. P. July—September. Lofthouse (Mr. Roberts,) Notton, Went Vale.

C. glomerata, L. Clustered Bell-flower. P. July—September. Garforth, Kippax, Went Vale, &c.

JASIONE. *Linn.* Sheep's-bit.

J. montana, L. Annual Sheepsbit. A. or B. June—September. Frequent.

ORDER.—VACCINIACEÆ.

VACCINIUM. *Linn.* Whortleberry.

V. Myrtillus, L. Bilberry, or Whortleberry,. S. April—June. Frequent.

Sub-Class III. Corolliflorae.

Order—ERICACEÆ.

Erica. *Linn.* Heath.

E. Tetralix, L. Cross-leaved Heath. S. July—September. Hessel near Ackworth, Woolley Edge, Ryhill.

E. cinerea, L. Fine-leaved Heather. S. July—September. Heath, Outwood, Woolley Edge, New-Miller Dam, Went Vale.

Calluna. *Salisb.* Ling.

C. vulgaris, Salisb. Common Ling. S. June—August. Ardsley, Woolley, Ryhill, &c.

Order—AQUIFOLIACEÆ.

Ilex. *Linn.* Holly.

I. aquifolium, L. Common Holly. S. May—June. Common.

Order—OLEACEÆ.

Ligustrum. *Linn.* Privet

L. vulgare, L. Privet. S. June—August. Frequent in hedges but never wild.

Fraxinus. *Linn.* Ash.

F. excelsior, L. Common Ash. T. April. Common. The seed vessels are in some parts called "keys." The same term is applied to the seed vessels of the maple.

Order—APOCYNACEÆ.

Vinca. *Linn.* Periwinkle.

V. minor, L. Lesser Periwinkle. P. April—June. Stanley, Not wild.

V. major, L. Greater Periwinkle. P. April—June. Occasionally, but not wild. These two plants are the only representatives we have in the British Flora of this order which contains amongst other deadly poisons the *Strychnos Nux-Vomica* (yielding Strychnine) and the *Strychnos toxifera* (yielding the celebrated *Wourali Poison.*)

Order—GENTIANACEÆ.

Erythræa. *Renealm.* Centaury.

E. Centaurium, Pers. Common Centaury. A. July—September. Frequent.

Gentiana. *Linn.* Gentian.

G. Amarella, L. Small flowered Gentian. A. July—October. Garforth, Went Vale, Ledstone, Glass Houghton (Mr. Roberts).

G. campestris, L. Field Gentian. A. August—October. Glass Houghton, (Mr. Roberts,) I have not seen this plant from this locality.

CHLORA. *Linn.* Yellow-wort.

C. perfoliata, L. Perfoliate Yellow-wort. A. June—September. Ledstone, (Mr. Roberts,) Went Vale, Kippax, Garforth.

ORDER—CONVOLVULACEÆ.

CONVOLVULUS. *Linn.* Bindweed.

C. arvensis, L. Small Bindweed. P. June—August. Common.

C. sepium, Br. Great Bindweed. P. June—September. Common.

CUSCUTA. *Linn.* Dodder.

C. europæa, L. Great Dodder. A. July—September. Lofthouse, parasitic on *Galium* (Mr. Roberts.)

THE FOOD OF BIRDS.

BY THE REV. F. O. MORRIS, B. A.

No one, I think, but must admit that the invariable practice of good Naturalists has been to raise their voice in the cause of humanity. In the belief then that you will admit a few considerations on the above subject which may be new to some of your readers, and plead in favour of our native birds, subjected I fear, to most unjust destruction, I will trespass on your space, if you will give me such leave, as briefly as I possibly can with that object in view.

No one is better aware than I am that a cause often rather suffers than gains from extreme and overstrained advocacy, and those who are acquainted with my writings on Natural History, which the early favours of the public have made so much more voluminous than I ever contemplated, will be well aware that while I have never lost an opportunity of pleading for the poor birds, whose misfortune has been that they have not had a more able advocate, I have never concealed that they do some amount of damage to our crops and gardens.

Now, I will concede three points to those, who, as I think, and indeed feel sure, are unduly prejudiced against the birds on account of supposed, or exaggerated depredations committed by them.

First, that they do a certain amount of harm to our corn crops when ripe in the fields, and to our garden fruits when ripe in the gardens.

Second, that this evil cannot be prevented except by diligent watchfulness in the "tented field," and by constant care in our walled or open gardens.

Third, that even beyond this they would do us far more harm than they do, and that with one exception, all the year round, if there was corn in the fields and fruit in the gardens for them to prey upon for the remainder of the year, beyond some month in harvest and a month of the fruit season.

To take the exception first, and a most material exception it is, affecting as it does other thus prevented injuries to our crops and our gardens during the remainder of the year. I allude, of course, to the time or rather the times of the year when the "birds have nests." I say times, for as I have elsewhere had occasion to point out, some of our birds, and those, be it remembered, the ones which are the most destructive in our gardens, namely blackbirds and thrushes, &c., have not only one, but two, three, or even four broods in the year. Now the young of all these birds are fed, I may say exclusively, on insects, and I have before now given the readers of the *Times* a most remarkable account of the number of times the young of some species are fed day by day. Nay, not only do the insectivorous birds do this, but those which at other times, or even at the same time, are, as to their own food, generally graminivorous, feed their young on insects, caterpillars, and such like.

(To be continued.)

LIST OF NORFOLK DIURNI AND NOCTURNI NOT MENTIONED BY Mr. GUNN.

By the Rev. T. H. Marsh.

C. Hyale. At East Dereham.
V. Antiopa. Once at Mulbarton, also at Marsham.
A. iris. Near Norwich and near Foulsham.
T. rubi. Cawston, Swannington and Horsford.
T. quercus. Cawston. Common, mentioned as rare by Mr. Gunn.
L. Ægon. Cawston. Common, mentioned as rare by Mr. Gunn.
L. Corydon. Near Thetford.
L. Argiolus. Cawston. Uncommon.
S. ocellatus. Not uncommon, Cawston, Dalling, &c.
S. populi. Not uncommon, Cawston, Dalling, &c.
S. tiliæ. Cawston. Not common.

A. Atropos. Cawston, Dalling, Blo-Norton, rather common this year.
S. convolvuli. Cawston and Dalling, not uncommon some seasons.
S. ligustri. Cawston, rather common.
C. Elpenor. Dalling and Foulsham.
M. fuciformis. Abundant this year at Horsford.
M. bombyliformis. Not uncommon at Cawston and Horsford.
S. tipuliformis. Cawston, rather rare.
S. spheciformis. Rare at Horsford, in stems of Alder.
S. apiformis. Cawston, not uncommon, in stems of Poplar.
C. ligniperda. Cawston, common.
H. hectus. Very common at Cawston.
H. lupulinus. Very common at Cawston,
H. sylvinus. Cawston, rather rare.
H. humuli. Common everywhere.
Z. trifolii. Cawston, plentiful.
Z, lonicerœ. Cawston, plentiful.
Z. filipendulæ. Cawston, rare.
N. cuculatella. Cawston and Foulsham, not uncommon.
N. cristulalis. Cawston and Foulsham, not uncommon.
N. senex. Cawston and Foulsham, not uncommon.
N. mundana. Cawston and Foulsham, rare.
L. minata. Cawston and Foulsham, not uncommon.
L. mesomella. Cawston, plentiful in some seasons.
L. complanula. Cawston, very common.
L. complana. Cawston, rare.
L. rubricollis. Cawston, not uncommon.
E. Jacobœæ. Cawston, plentiful.
C. mendica. Cawston, rare.
L. monacha. Cawston and near Foulsham.
O. pudibunda. Cawston, very common.
O. antiqua. Cawston, very common.
P. populi. Cawston. *Pupæ* at roots of Oak.
B. neustria. Cawston, common a few years since.
B. quercus. Cawston, very common.
O. potatoria. Cawston, very common.
L. quercifolia. Cawston, not common.
S. carpini. Cawston, not common.

Cawston Rectory, near Norwich.

THE VEGETATION OF SPITZBERGEN COMPARED WITH THAT OF THE ALPS AND PYRENEES.

By Chas. Martins

Prof. of Natural History, and Director of the "Jardin des Plantes," &c., at Montpellier.

(Continued from page 141.*)*

IV.—THE VEGETATION OF SPITZBERGEN AND LAPLAND COMPARED WITH THAT OF THE ALPS.

The polar flora is circumscribed by an impassable barrier—the heats of summer— ; but before the present geological epoch the earth passed through a period of great cold ; glaciers in the form of a cap which surrounded the pole, stretched as far south as central Europe, America, and Asia, lowering the temperature, and transporting great blocks of stone, and masses of sand and gravel, carrying with them the plants which grew thereon, which were thus propagated little by little towards the south. Afterwards when a higher temperature supervened, melting the glaciers and causing them to retreat northwards, these plants overtaken by the heat, disappeared from nearly all the plains of Europe, but retained their stations on the mountains, such as the Sudetes, which comprise the whole chain of northern Germany, the Hartz, the Vosges, and above all the Alps. According to M. Heer, Switzerland counts 360 alpine species, of which 158 are found in the north of Europe ; and he also enumerates 42 of them which are even found in the plains of the Canton of Zurich.

The Faulhorn in the Canton of Berne is terminated by a cone rising from a plateau on which is a small glacier. This cone having a gradual slope towards the south, forms an abrupt precipice to the north ; its height is 65 metres (221 feet) its superficies is $4\frac{1}{2}$ hectares ($4\frac{3}{4}$ acres) and the summit is 2683 metres (8,800 feet) above the level of the sea. Upon this cone, covered with snow during eight months of the year, I have gathered, with my friend M. Bravais, during several visits in the years 1841-2-4-6, 132 species of flowering plants, of which I append a list, revised and corrected by my late lamented friend M. Jean Gay, to whom alpine botany owes so much :—

Flowering Plants on the Summit of the Faulhorn.

(The species followed by an asterisk (*) are found also in Lapland ; those in italics on the summit of the Pic du Midi de Bigorre and in the Pyrenees.)

Ranunculaceæ. Ranunculus montanus Wild, ; R. glacialis * L. ; R. alpestris, L, ; Aconitum Napellus, L.

Cruciferæ. Arabis alpina, * L. ; A. Gerrardi, Bess. ; Cardamine bellidifolia, * Gaud. ; Draba fladnizensis, Wulf. ; D. frigida, Suter ; *D. aizoides*, L. ; *Thlaspi rotundifolium*, Gaud. ; Capsella bursa-pastoris * D. C. ; *Lepidium alpinum*, L.

Violaceæ. Viola calcarata, L.

Cistaceæ. Helianthemum alpestre, D.C.

Caryophyllaceæ. Silene inflata, Sm. ; *S. acaulis*, * L. ; Mœhringia polygonoides, Mert. and Koch. ; *Alsine verna*, Bartl. ; Spergula saginoides, L. Arenaria biflora, L. ; A. ciliata, L. ; Stellaria media, * Sm. ; S. *cerastoides*, L. ; Cerastium arvense, L. ; *C. latifolium*, * L. ; *Cherleria sedoides*, L.

Leguminosæ. Trifolium pratense, L. ; T. badium, L. ; T. cæspitosum Reyn. ; Astragalus alpinus, * L. ; Oxytropis laponica, * Gay ; *O. campestris*, * D.C. ; Hedysarum obscurum * L.

Rosaceæ. *Sibbaldia procumbens*, * L., Dryas octopetala, L. ; Geum reptans, L. ; G. montanum, L. ; Potentilla glacialis, Hall, ; P. salisburgensis, Hœncke ; P. grandiflora, L. ; P. aurea, L. ; *Alchemilla vulgaris*, * L. ; A. alpina, * L. ; A. pentaphylla, L. ; A. fissa, Schum.

Onagraceæ. Epilobium alpinum, * L.

Crassulaceæ. *Sedum repens*, Schll. ; *S. atratum*, L.

Saxifragaceæ. Saxifraga stellaris, * L. ; *S. aizoides*, L. ; *S. bryoides*, L. ; S. muscoides, Wulf. ; S. planifolia, Lapey. ; S. aizoon, Jacq. ; *S. oppositifolia*, * L. ; S. androsacea, L. ; S. Seguerii, Spr.

Umbelliferæ. Gaya simplex, Gaud. ; Ligusticum mutellina, Cr. ; Carum carui, * L.

Rubiaceæ. Galium helveticum, Weig. ; G. sylvestre var. alpestre, Koch.

Dipsaceæ. Scabiosa lucida, Vill.

Synantheræ (Compositæ). Tussilago alpina, L. *Erigeron uniflorus*, * L. ; *E. alpinus*, * L. ; Aster alpinus, L. ; *Arnica scorpioides*, L. ; *Artemisia spicata*, L. ; Chrysanthemum leucanthemum, * L ; *Pyrethrum alpinum*, Willd. ; Achillæa atrata, L. ; *Omalotheca (Gnaphalium,) supina*, var. subacaulis, D.C. ; Cirsium spinosissimum, Scop. ; Leontodon aureum, L. ; L. hispidus, L. ; Taraxacum dens-leonis,* Desf.

CAMPANULACEÆ. Campanula linifolia, Lam. ; C. pusilla, Hæncke, ; *Phyteuma hemisphericum*, L.

PRIMULACEÆ. Primula farinosa, * L. ; Androsace helvetica, Gaud. ; A. alpina, Gaud. ; A. pennina, Gaud. ; A. obtusifolia, All. ; A. chamægasme, Willd. ; Soldanella alpina, L.

GENTIANACEÆ. *Gentiana acaulis*, L. ; G. bavarica, L. ; *G. verna*, L. ; G. campestris, L. ; G. nivalis, * L. ; G. glacialis, A. Thom.

BORAGINACEÆ. *Myosotis sylvatica*, var. *alpestris*, Koch.

SCROPHULARIACEÆ. *Linaria alpina*, D. C. ; Veronica aphylla, L. ; *V. saxatilis*, * Jacq. ; V. bellidioides, L. ; V. alpina, * L. ; V. serpyllifolia,* L. ; Bartsia alpina * L. ; Euphrasia minima, Jacq. ; Pedicularis versicolor, Wbg. ; P. verticillata, L.

LABIATÆ. *Thymus serpyllum*, L.

PLANTAGINACEÆ. Plantago montana, Lam. ; *P. alpina*, L.

CHENOPODIACEÆ. Blitum bonus-henricus, C.A.M.

POLYGONACEÆ. *Polygonum viviparum*, * L. ; *Oxyria digyna*, * Cambd.

SALICACÆ. Salix herbacea, * L. ; *S. retusa*, L.

LILIACEÆ. Lloydia serotina, Salisb. (Phalangium serotinum, Lam.)

JUNCACEÆ. Juncus Jacquini, L. ; Luzula spadicea, D.C. ; L. spicata * D.C. ; Elyna subspicata, Schr.

CYPERACEÆ. Carex fœtida, All. ; *C. curvula*, All. ; C. nigra, All. ; C. sempervirens, Vill.

GRAMINACEÆ. Phleum alpinum,* L. ; Sesleria cærulea, L. ; Agrostis rupestris * All. ; *A. alpina*, Willd. ; Avena versicolor, Vill. ; *Trisetum subspicatum*, * Palis. ; Poa annua, L. ; P. alpina, var. vivipara, * *P. alpina*, ii. brevifolia, Gaud, ; Poa laxa, Hæncke, ; *Festuca violacea*, Gaud. ; F. pumila, Vill. ; F. Halleri, Vill.

Amongst these plants I find eight which occur in the flora of Spitzbergen, viz :—*Ranunculus glacialis*, *Cardamine bellidifolia*, *Silene acaulis*, *Arenaria biflora*, *Dryas octopetala*, *Erigeron uniflorus*, *Saxifraga oppositifolia*, and *Polygonum viviparum*, and forty marked with * are found also in Lapland. None of them belong to the Arctic flora, properly so-called, but all are of the Scandinavian flora. The small number of Spitzbergen plants on the Faulhorn is explained by two circumstances. Although the mean annual temperature is — 2.3° (28° Fahr.) the summer is relatively warm to that of Spitzbergen ; we may estimate the mean in summer at 3.3° (38° Fahr.) and towards the middle of the day the thermometer oscillates around 10° (50° Fahr.) The soil besides, is considerably heated, as on all high moun-

tains † whilst in Spitzbergen it is always cold, moist, and frozen at a few inches below the surface. The soil of the Faulhorn is then too warm for Spitzbergen plants, and not humid. The terminal cone composed of a disintegrated black limestone, is dry and arid when the snows have disappeared ; whilst the soil of Spitzbergen is always humid and even spongiose, in all those parts where vegetation is developed. The other plants which grow on the terminal cone of the Faulhorn, are plants of the north of Europe, alpine species or those which in the Swiss plains or the inferior mountainous regions, are elevated to the summit.

(To be continued)

NOTES ON NORFOLK ENTOMOLOGY—LEPIDOPTERA.

By T. E. Gunn.

Part IV.—Geometræ.

Ourapteryx sambucata. Common and generally distributed. Imago on wing during July and August.

Epione vespertaria, Very rare. I have one example, a male, in my collection, it was taken by Mr. Sayer, at Neatishead in 1860.

E. apiciaria. Uncommon but distributed. Cawston, Revs. T. H. Marsh, and G. Norris. Around Norwich by Mr. R. Gunn.

E. advenaria. Very rare. I took one example near Norwich in 1863.

Rumia cratægata. My brother, C. J. Gunn, obtained for me a very curious variety of this abundant species, during the latter part of last May ; both the upper and under surface of its wings, with the exception of one of the hinder, are of a pale reddish brown, marked with longitudinal lines of a sulphur colour.

Venilia maculata. Uncommon and local. Cawston, Rev. T. H. Marsh.

Angerona prunaria. Not uncommon, Cawston.

Metrocampa margaritata. Not uncommon and distributed.

Ellopia fasciaria. Rare. Cawston, Revs. T. H. Marsh, and G. Norris.

Eurymene dolabraria. Local. Cawston, has been taken quite plentifully

† See my observations between Bagnéres de Bigorre and the Pic du Midi, *(Comptes rendus de l' Acad. des Sciences de Paris,* 17th Oct., 1864.) *Auct.*

at Neatishead by Mr. Sayer, Mr. J. Perry has taken one this season at Wooton near Norwich.

Pericallia syringaria. Uncommon but distributed. Horsford, Neatishead, Cawston, &c. I have taken it in Mile-end lane, near Norwich.

Selenia illunaria. Not uncommon and generally distributed.

Odontopera bidentata. Not uncommon and generally distributed.

Crocallis elinguaria. Common in July and August.

Ennomos tiliaria. Rare, local; around Norwich and at Neatishead, by Mr. Sayer, near Cawston by the Rev. T. H. Marsh.

E. erosaria. Rather rare, I have taken it while at rest on the trunks of elm trees, in Chapel Field, in 1862 and 1864. The Rev. T. H. Marsh has obtained it near Cawston.

E. angularia. Rather rare, I obtained one example from the trunk of an elm in Chapel Field, in 1862.

Himera prunaria. Generally distributed; I have captured examples as late as November.

Phigalia pilosaria. Not uncommon near Cawston.

Biston hirtaria. Rare. I bred one, a male, from larva which I found feeding on elm near my own residence in 1863. The Rev. T. H. Marsh also records it near Cawston.

Amphydasis prodromaria. Generally distributed, but uncommon.

A. betularia, Common, bred.

Hemerophila abruptaria. Generally distributed and not common; I have taken this beautiful insect while at rest on the trunks of trees, old walls, &c.; of the former they generally prefer the elm, and doubtless many a young collector passes without detecting them, as they sit with outspread wings on a part of the trunk where perhaps the bark has been broken off, and so closely do they resemble it in colour, that I have often been deceived myself until a closer examination.

Cleora lichenaria. Uncommon, local, Cawston, Rev. T. H. Marsh, Neatishead in 1862, Mr. Sayer.

Boarmia repandata. Common.

B. rhomboidaria. Very common.

B. roboraria. Rare; Foulsham, Revs. T. H. Marsh and G. Norris.

Tephrosia crepuscularia. Rare; Foulsham, Revs. T. H. Marsh and G. Norris.

T. cuindularia. Rare; Foulsham, Revs. T. H. Marsh and G. Norris.

T. punctulata. Rare; Foulsham, Revs. T. H. Marsh and G. Norris.

Gnophos obscurata. Very rare; one taken at Yarmouth, in 1860, Mr. Sayer.

Pseudopterpna cytisaria. Not uncommon around Cawston.

Geometra papilionaria. Rare ; Cawston and Foulsham, Revs. T. H. Marsh and G. Norris.

Iodis lactearia, Common.

Phorodesma bajularia, Rare ; Foulsham, Rev. T. H. Marsh.

Hemithea thymiaria, Generally distributed and pretty common:

Ephyra punctaria. Not uncommon near Cawston, Rev. T. H. Marsh.

E. trilinearia. Common.

E. omicronaria. Uncommon and distributed, Cawston, Rev. T. H. Marsh; Ketteringham, Mr. R. Gunn.

E. orbicularia. Rare ; Cawston, Revs. T. H. Marsh and G. Norris.

E. pendularia. Rare ; Foulsham, Revs. T. H. Marsh and G Norris.

Hyria auroraria. Rare ; Mr. I. S. Sayer obtained two specimens at Neatishead in 1862. The Rev. T. H. Marsh also records it near Cawston.

Asthena luteata. Abundant around Cawston.

A. candidata. Not uncommon and distributed. Plentiful this season at Ketteringham.

A. sylvata. Uncommon near Foulsham, Revs. T. H. Marsh and G. Norris.

Eupisteria heparata. Rare ; Cawston, Rev. T. H. Marsh.

Venusia cambricaria. Rare, local, I have one example in my collection taken in 1862, at Neatishead, by Mr. Sayer.

Acidalia rubricata. Very rare ; Cawston, Rev. T. H. Marsh.

A. scutulata. Not uncommon and distributed. I have taken it at Ketteringham and around Norwich.

A. bisetata. Common and generally distributed.

A. osseata. Common and generally distributed.

A. incanata. Common and generally distributed.

A. ornata. Wood Dalling, Rev. G. Norris.

A. promutata. Rather rare. I have taken it while at rest on old walls, &c., around Norwich.

A. immutata. Distributed and generally abundant.

A. remutata. Common and generally distributed.

A. fumata. Common around Cawston.

A. imitaria. Common around Cawston.

A. emutaria. Common around Cawston.

A. aversata. Very common. I have several varieties.

A. inornata. Common near Cawston.

A. emarginata. Uncommon but generally distributed around Norwich and at Neatishead, Mr. I. S. Sayer. Cawston, Rev. T. H. Marsh. I have taken it at Kimberley.

Timandra amataria. Generally distributed and not uncommon.

Cabera pusaria. Common and distributed. Plentiful this season at Kettringham.

C. rotundaria. Not so common as the preceding, taken in the same locality.

C. exanthemaria. Common and distributed. Plentiful this season at Ketteringham.

Corycia temerata. Rather uncommon. Neatishead, Mr. Sayer. Cawston, Rev. T. H. Marsh. I have taken it around Norwich.

C. taminata. Generally distributed and not uncommon.

Macaria liturata. Not uncommon around Cawston.

Halia wavaria. Abundant everywhere, resting on old walls, &c.

Strenia clathrata. Common and distributed, quite plentiful at Ketteringham this season.

Panagra petraria. Generally distributed and pretty common on all heaths.

Numeria pulveraria. Rare. Cawston, Revs. T. H. Marsh and G. Norris.

Fidonia carbonaria. Very rare. Mr. I. S. Sayer caught one at Neatishead, in 1858. I have also had the pleasure of taking one on Mousehold Heath near Norwich, during the season of 1863, and still have it in my collection.

F. atomaria. Pretty common on all heaths. Abundant this season on Mousehold. I have three or four varieties.

F. piniaria. Generally distributed and not uncommon on heaths. Mr. J. Perry caught a very pale variety at Horsford, this season.

Abraxas grossulariata. Abundant in every garden.

A. ulmata. I was not aware of the existence of this truly local species in Norfolk, until the present season. On the 19th of June my father was fortunate in capturing a magnificent example at Ketteringham. After carefully pinning and boxing his capture, he diligently searched for other individuals, which he doubted not, from the habits of this species were to be found in the same spot, but all his endeavours to secure another proved unsuccessful, and on several occasions since, when visiting the same neighbourhood, has he vainly explored the same locality over and over again in search

of his much desired object, still failing however to discover any further traces of this remarkable visitant.

Ligdia adustata. Not uncommon around Norwich and Cawston.

Lomaspilis marginata. Common and distributed. Plentiful at Ketteringham this season.

Hybernia rupicapraria. Common and widely distributed. The Gaslights of our workshops prove a source of great attraction to this early species during January and February.

H. leucophearia. Common.

H. aurantiaria. Rare. I have one in my collection taken at Neatishead in 1862. The Rev. T. H. Marsh also records it near Cawston.

H. progemmaria. Common and generally distributed.

H. defoliaria. Common and generally distributed. I have taken it at gaslight in December.

Anisopteryx Æscularia. Common and generally distributed.

Cheimatobia brumata. Common and generally distributed.

C. boreata. Local. Neatishead and Cawston.

Oporabia dilutata. Common.

O. filigrammaria. Pretty common around Cawston.

Larentia didymata. Common and generally distributed.

L. multistrigaria. Rare, local. I have two examples in my collection, taken in 1862, at Neatishead by Mr. Sayer. The Rev. T. H. Marsh also mentions its occurrence near Cawston.

L. olivata. Pretty common at Cawston.

L. pectinitaria. Uncommon.

Emmelesia affinitata. Not uncommon but distributed.

E. alchemillata. Rare. Cawston, Rev. T. H. Marsh. I have a specimen in my collection but am not certain of its locality.

E. decolorata. Common.

Eupithecia venosata. Rare. My friend Mr. George Cooke presented me with two examples of this species out of four which he obtained in this neighbourhood in 1862. Mr. J. Perry captured one at Horsford in June 1863. And the Revs. T. H. Marsh and G. Norris records it in their list near Cawston.

E. linariata. Rare, Cawston.

C. succenturiata. Common.

E. plumbeolata. Common.

E. satyrata. Rare. Cawston, Rev. T. H. Marsh.

E. castigata. Pretty common near Cawston.

E. indigata. Pretty common near Cawston.

E. nanata. Pretty common near Cawston.

E. vulgata. Common and distributed.

E. absynthiata. Rare. Cawston, Rev. T. H. Marsh.

E. minutata. Rare. Cawston, Rev. T. H. Marsh.

E. assimilata. Pretty common near Cawston.

E. tenuiata. Rare. Cawston.

E. subcilliata. Common.

E. abbreviata. Common.

E. pumilata. Not uncommon. It is taken around Norwich.

E. coronata. Not uncommon.

E. rectangulata. Rare. Cawston, Rev. T. H. Marsh. I have one in my collection taken near Neatishead in 1859.

Lobophora sexalata. Rare. I took one example near Norwich last season.

L. polycommata. Local. Common at Philadelphia near Norwich, Mr. Sayer.

Thera variata. Not uncommon. Cawston.

T. firmata. Not uncommon. Cawston.

Ypsipetes impluviata. Common.

Y. elutata. Common.

Melanthia rubiginata. Common.

M. ocellata. Common.

M. albicillata. Very abundant at Neatishead from 1859 to 1862. Cawston, T. H. Marsh.

Melanippe procellata. Rare. I have one specimen taken by my brother, Mr. William Gunn, while at rest in the Crescent, Norwich, this season.

M. unangulata. Rare. Cawston, Rev. T. H. Marsh. I have one taken in this neighbourhood.

M. rivata. Rare. Cawston.

M. subtristata. Not uncommon and distributed around Norwich.

M. montanata. Common.

M. galiata. Rare. Cawston, Rev. T. H. Marsh.

M. fluctuata. Common.

Coremia propugnata. Common.

C. ferrugata. Common.

C. quadrifasciaria. Common. Cawston.

Camptogramma bilineata. Plentiful on hawthorn hedges during mid-summer.

Phibalapteryx lignata. Rare. Cromer, Rev. T. H. Marsh.

Scotosia dubitata. Rare. One of my younger brothers caught a fine specimen, that flew into our room one evening this summer, it being attracted thither by the light.

S. certata. Rare. Cawston, Revs. T. H. Marsh and G. Norris.

S. undulata. Rare. Cawston, Revs. T. H. Marsh and G. Norris.

Cidaria miata. Abundant around Cawston.

C. picata. Pretty common at Foulsham.

C. corylata. Pretty common at Cawston.

C. russata. Common and distributed.

C. immanata. Common.

C. suffumata. Common.

C. silaceata. Rare. Cawston and Foulsham, Revs. T. H. Marsh and G. Norris.

C. prunata. Very common and distributed.

C. testata. Common.

C. populata. Common.

C. fulvata. Common.

C. pyraliata. Common.

Pelurga comitata. Rare. Cawston, Revs. T. H. Marsh and G. Norris.

Eubolia cervinaria. Pretty common at Neatishead and Cawston. I have taken it around Norwich.

E. mensuraria. Common at Cawston.

E. palumbaria. Common at Cawston.

E. bipunctaria. Rare, local. I have one in my collection taken at Horsford.

E. lineolata. Uncommon and distributed around Neatishead and Norwich.

Anaitis plagiata. Not uncommon and distributed.

Norwich, September 1865.

Reports of Societies.

High Wycombe Natural History Society.—A special excursion took place on Tuesday, September 26th, when the members proceeded by rail to Wheatley Station to examine the geological formations that crop out in that locality. Two quarries were visited first in Wheatley, which were found to consist of Calcareous Grit and Coral Rag in strata inclined at a considerable angle. A few fossils were obtained there, but they were very imperfect. A very prolific bed of coprolites was however found lying beneath about four feet of Kimmeridge clay in a ferruginous layer of sand separating the clay from the underlying stone. Among some fossils obtained here was a good specimen of *Nucleolites dimidiatus* (resembling the *Micraster* of the chalk, but much flatter), which one of the quarrymen gravely informed the members was "generally believed to be a kind of button." A labourer then conducted the members to a neighbouring brick yard to examine the clay beds there. They were found to be Kimmeridge Clay, the formation immediately overlaying the Coral Rag. Here were obtained vertebræ of three species of *saurians*, together with some magnificent *Ammonites biplex* and *A. triplex*, and some very fine and perfect crystals of selenite. When the presence of the Society became known in the neighbourhood, it appeared a matter of jealousy as to who should bring the largest supply of fossils, for there were constant arrivals until the time of departure. After a substantial dinner at the "Sun," the Holton quarry was visited, about a mile from Wheatley. Here two specimens of coral were obtained, and a few shells, bones, and teeth. Altogether the members had great reason to be gratified with the result of the day's work: among the fossils yet unmentioned were *Rhynchonella inconstans*, *Plagiostoma rigida*, *Ostrea virgula*, and casts of *Chemnitzia striata* and *C. Headingtoniensis*.

Observations.

Birth of a Hippopotamus.—In a former number we noticed this occurrence at the Amsterdam Gardens, which we now supplement by a few details that have since come to hand. For some hours previous to delivery the animal was observed to be in a profuse perspiration which was of a red colour and ran down her body in streams. When the critical moment arrived she took such a position that the young one came against the bars of the house, between which there is room enough for a man to pass, but the little animal proved so heavy, slippery and strong, that the keepers could not get it through the bars, so they were compelled to enter the enclosure in order to secure it just as the mother was recovering herself and rising to defend her progeny. The young Hippopotamus was placed in a basket made for the purpose and taken to the place prepared for it, a large room where was a long cage, at the end of which is a tank containing water; underneath is a hot water apparatus to heat the room, and give the requisite temperature to the water. The animal is fed upon milk mixed with a little water, and takes about two gallons and a half daily; which is served to him in six or seven meals. It daily increases in size, is very playful and appears to be on very good terms with its keeper. In the case of this animal, copulation had taken place on the 6th and 7th of December 1864, so that the period of gestation may be considered to be between eight and nine months.—W.

In the museum at Antwerp is preserved a bird wonderfully resembling the Argus Pheasant, being the produce of a male Pea fowl and female Guinea fowl.

Birds.—Dates of appearance of summer visitors, 1865. :—

April 9th Heard and saw Chiffchaff.
... 10th Heard Willow Wren.

April 13th Saw Tree Pipit, Yellow Wagtail and Swallow.
... 16th Saw Redstart.
... 18th Heard Garden Warbler.
... 23rd Heard Whitethroat.
... 25th Heard Cuckoo.
... 29th Saw Whinchat.
May 2nd Heard Sedgewarbler and Corncrake, and saw a pair of Grey Wagtails.
... 15th Heard Wood Warbler, and got eggs of Lesser Whitethroat.
... 18th Flycatcher arrived.

Martins arrived last and have not been numerous. I passed a breeding place on the 30th of April but none had come.—GEO. ROBERTS, Lofthouse.

Variety of the Chaffinch.—On the 29th September a curious variety of this species, *Fringilla cœlebs*, was killed out of a flock, on the estate belonging to J. Lomax, Esq., of Clayton Hall, by his gamekeeper, and is now in the possession of Mr. Thomas Jones of Church. The top of the head is a lead colour speckled with white and with a pinkish hue round the eyes; the back is a yellowish green; wings, lead colour; wing coverts barred with white and lead colour. The first and second tail feathers are white the rest with the tail coverts lead colour. The breast is of a pinkish hue, bill pink, the legs of a glossy brown. It was a male bird.—SIDNEY SMITH, Church near Accrington.

Capture of Acherontia atropos and *Deilephila lineata.*—About a fortnight ago, I had a very fine specimen of *Acherontia atropos* brought to me, which on the Sunday previous had entered a house sometime during the evening. It was captured by a young man, who, not caring about Entomology, drove the intruder out of his house. The day following it entered the next cottage, and another youth, probably having more regard for the beautiful in nature, secured the prize, and after keeping it a few days handed it over into my keeping. Another remarkable specimen now in my possession is *Deilephila lineata.* It was found in the larva stage feeding on *Galium Molugo*, by a little boy. I obtained it from him in the chrysalis form on the 4th of September; it emerged on the 27th a beautiful and fully developed *imago.* It measures in expanse of the wings three inches and an eighth.—SAMUEL GIBSON, Hebden Bridge, Yorkshire.

Cuscuta trifolii in Perthshire.—I have to record the occurrence of, I believe, a new plant to the Scottish Flora. This is *Cuscuta trifolii*, Bab., which I have found rather abundantly in a clover field in the neighbourhood of Perth. Prof. Babington thinks (I quite agree with him) that it cannot however be considered a native of Perthshire, having probably been introduced with the clover seed. He considers this to be its usual origin in England also. I shall be happy to send a Scottish specimen to any botanist, on the receipt of a stamped addressed envelope. I have lately found near Dunkeld, *Thera juniperata*, (imagines and pupæ) and *T. coniferata*, (larva) This is a new station for these local insects. —F. BUCHANAN WHITE, M.D., Perth, Oct. 9th, 1865.

A few plants gathered, or observed in Craven, in May;—

Clematis vitalba. Stream side, near the New Inn, Clapham.
Trollius europœus. Malham.
Meconopsis cambrica. Chapel-le-Dale.
Cheiranthus Cheiri. Castleberg, Settle.
Viola lutea. Gordale and other places. Many plants have the upper petals purple, or tipped with purple.
Arenaria verna. On the borders of the Kingsdale beck.
Geranium sylvaticum. Malham.
G. lucidum. Malham.
Prunus Padus. Malham and other places.
Geum rivale. Malham, Clapham, and other places. This plant is not inappro-

priately called "nodding avens," by the country people.

Potentilla verna. Between Malham and Settle.

Sedum Telephium. Near Ingleton.

Ribes Grossularia. Road side, Coniston Cold, and near Chapel-le-Dale, growing on the walls.

Saxifraga granulata. Malham. Common.

S. Geum. Chapel-le-Dale.

Adoxa moschatellina. About Kingsdale beck.

Valeriana dioica. Malham. Common.

Carduus heterophyllus. Near Clapham.

Gnaphalium diocium. Kingsdale beck and Clapham.

Primula farinosa. Gordale.

Pinguicula vulgaris. Kingsdale, on wet rocks.

Polemonium cæruleum.

Pedicularis palustris. Highside, near Malham.

P. sylvatica. Banks of the Greta, near Chapel-le-Dale, in large beds.

Lamium maculatum. Malham and Chapel-le-Dale. A plant with large leaves lined with white and purple flowers. I saw the same growing in a garden at Malham.

Taxus baccata. Gordale, in clefts of the rocks, &c.

Paris quadriflora. Chapel-le-Dale, one or two plants.

Polypodium Phegopteris. On the rocky banks of Kingsdale beck.

P. Dryopteris. Malham and Kingsdale, in beds among loose stones.

P. calcareum. Kingsdale.

Allosorus crispus. South side of Ingleborough.

Blechnum spicant. Kingsdale, not frequent

A local fernist informed me that *Aspidium Lonchitis*, grows on Ingleborough, but in an inaccessible spot.—GEORGE ROBERTS, Lofthouse, Wakefield.

Exchange.

Lepidoptera.—I have several duplicates of the following Insects for exchange :—*G. rhamni, C. Edusa, A. Paphia, A. Adippe, A. Euphrosyne, V. cardui, A. Galathea, S. Semele, T. quercus, L. Corydon, L. Alsus, S. Alveolus, T. Tages, and H. Acteon* (the latter taken at Lulworth in July,) *S. tilia, C. Elpenor, M. stellatarum, P. statices, E. Jacobœæ, C. Dominula, L. dispar, E. lanestris, B. neustria, B. quercus, E. apiciaria, G. cytisaria, A. imitaria S. clathrata, F. atomaria, X. polyodon, T. Janthina, H. stagnata* and *A. flexula.* I have one of each of the following continental specimens :—*P. podalirius*, and *P. Apollo*, also several very fine and lively *pupæ* of *A. atropos*, for which I should be glad to receive offers. I give a list of those insects I particularly want :—*C. porcellus, M. fuciformis, T. esculi, L. monacha, E. russula, B. rubi, E. tiliaria, G. papilionaria. T. Fimbria, C. Prasinana, A. cratœgi, L. sinapis, L. sybilla, A. Aglaia, &c.*—Address, Miss BESSIE DIBBEN, Bishopstone, Salisbury, Wilts.

I have a quantity of British Bird's Skins on hand which I want to exchange. Write stating your wants, to ANTHONY S. BRADBY, Moundsmere, Preston Candover, Micheldever Station, Hampshire.

I have splendid Imagos of *A. atropos* for exchange, also *pupæ* of the same. Applicants not hearing from me within a week may conclude their offers are not required.—RICHARD HEBSON, Barlby Bank, Selby.

Original Articles.

MATERIALS FOR A FLORA OF WAKEFIELD AND ITS NEIGHBOURHOOD.

By T. W. Gissing.

(Continued from page 168.)

Order—BORAGINACEÆ.

Echium. *Linn.* Viper's Bugloss.

E. vulgare, L. Common Viper's Bugloss. B. July—August. Horbury, Crofton, Featherstone, Pontefract, Ledstone.

Pulmonaria. *Linn.* Lung-wort.

P. angustifolium. L. Narrow-leaved Lung-wort. P. May—July. Haw Park (1857). I never saw a plant from this locality and insert it only from the report of the finder.

Lithospermum. *Linn.* Gromwell.

L. arvense, L. Corn Gromwell. A. May—July. In waste places and corn-fields. A common name is "stony-hard."

L. officinale, L. Common Gromwell, or Grey Millet. P. June—August. Garforth, Kippax.

Myosotis. *Linn.* Scorpion Grass.

M. palustris, With. Forget-me-not. P. June—August. Wet places. Frequent. The popular name of this plant seems to have been applied to it for only about forty years—the name "Forget-me-not", belonging originally to *Veronica Chamædrys*, (popular Bird's eye). For a very interesting article upon this change of name, see Dr. Prior's "Popular names of British plants."

M. cæspitosa, Schultz. Tufted water Scorpion-grass. A. or B. May—June. Frequent.

M. sylvatica, Hoffm. Wood Scorpion-grass. P. May—July. Ackworth, Hugset Wood near Barnsley.

M. arvensis, Hoffm. Field Scorpion-grass. A. or B. June—August. Common

M. versicolor, Lehm. Yellow and Blue Scorpion-grass. A. April—June. Heath, &c.

LYCOPSIS. *Linn.* Bugloss.

L. arvensis, L. Small Bugloss. A. June—July. Waste places and Corn fields.

SYMPHYTUM. *Linn.* Comfrey.

S. officinale, L. Common Comfrey. P. May—July. Near Wakefield—Doubtfully wild.

CYNOGLOSSUM. *Linn.* Hound's-tongue.

C. officinalis, L. Common Hound's-tongue. B. June—July. Frequent.

ORDER—SOLANACEÆ.

DATURA. *Linn.* Thornapple.

D. Stramonium, L. Common Thorn-apple. A. July—October. About a score plants were found this year in a waste place near Chald House, Wakefield. No one had planted them and no one could give any information about them.

HYOSCYAMUS. *Linn.* Henbane.

H. niger, L. Common Henbane. B. June—August. In 1856 I found two plants (first year's) in the lane leading from Sandal Castle to the Church; they either died or were destroyed before the next year, and I have not seen the Henbane in this district since.

SOLANUM. *Linn.* Nightshade.

S. Dulcamara, L. Woody Nightshade, Bittersweet, &c. S. June—August. Common.

ORDER—SCROPHULARIACEÆ.

VERONICA. *Linn.* Speedwell.

V. serpyllifolia, L. Thyme-leaved Speedwell. P. April—June. Common.

V. Beccabunga, L. Brooklime. P. April—August. Common.

V. officinalis, L. Common Speedwell. P. May—July. Frequent on Heath and other commons.

V. montana, L. Mountain Speedwell. P. April—July. Haw-Wood, Langley Wood, &c.

V. Chamædrys, L. Germander Speedwell, or Bird's Eye. P. May—July. Common.

V. hederifolia, L. Ivy-leaved Speedwell. A. February—October. Common.

V. agrestis, L. Procumbent Field Speedwell. A. April—October. Common. The variety *V. polita*, is frequent.

V. Buxbaumii, Ten. Buxbaum's Speedwell. A. April—October. Darton, Newton.

V. arvensis, L. Wall Speedwell. A. April—July. Frequent on walls, but more common on the *ground* in waste places.

BARTSIA. *Linn.* Bartsia.

B. Odontites, Huds. Red Bartsia. A. June—August. Common.

EUPHRASIA. *Linn.* Eyebright.

E. officinalis, L. Common Eyebright. A. May—October. Common.

RHINANTHUS. *Linn.* Yellow Rattle.

R. Crista-galli, L. Common Yellow Rattle. A. May—July. Common.

MELAMPYRUM. *Linn.* Cow-Wheat.

M. pratense. L. Common Yellow Cow-wheat. A. June—August. Frequent. As this plant is never found in meadows its specific name requires alteration.

PEDICULARIS. *Linn.* Louse-wort.

P. palustris, L. Marsh Louse-wort. A. or P. June—August. Hessle near Ackworth, Ryhill.

P. sylvatica, L. Dwarf Red Rattle, or Louse-wort. P. April—July. Common.

SCROPHULARIA. *Linn.* Figwort.

S. nodosa, L. Knotted Figwort. P. June—August. Common.

S. aquatica, L. Water Figwort. P. June—August. Common.

DIGITALIS. *Linn.* Foxglove.

D. purpurea, L. Purple Foxglove. P. June—August. Common. Occasionally found with white flowers, as well as with singular floral monstrosities.

LINARIA. *Juss.* Toadflax.

L. Cymbalaria, Mill. Ivy-leaved Toadflax. P. May—September. Occasionally on old walls, but naturalized.

L. spuria, Mill. Round-leaved Toadflax. A. July—September. Knottingley.

L. Elatine, Desf. Sharp-pointed Toadflax. A. July—September. Knottingley.

L. vulgaris, Mœnch. Yellow Toadflax. P. July—October. Common.

L. minor, Desf. Least Toadflax. A. June—October. Knottingley, Warmfield.

VERBASCUM. *Linn.* Mullein.

V. Thapsus, L. Great Mullein. B. July—September. Between Pontefract and Castleford.

NOTES ON THE MUSTELIDÆ OF NORTHUMBERLAND.

No. IV.—The Pole Cat.

By T. H. Gibb.

In years not far remote the pole cat was numerously and very generally dispersed throughout Northumberland; now however, its habitat has become more local, if not circumscribed to a few particular and favoured situations. The chief of these are those wild and thickly wooded districts, lying contiguous to the higher branches of the Tyne, and their tributaries, and to those regions bordering on our great hill ranges where they still abound to some extent. In the autumn of 1862, I saw as many as six individuals in the flesh offered for sale in Newcastle-on-Tyne, all of which had been captured on a tract of land bounding the North Tyne, and not exceeding a mile in extent. In 1863, a few specimens were taken near to the Cheviots, and in the succeeding year, a very magnificent old male of unusual size and strength was captured near to Harbottle by Mr. Clennel's gamekeeper, who was induced from its surpassing beauty to preserve its life, at least for a season; and for this purpose it was placed in an empty ferret house, built of stone, and otherwise strongly and compactly put together, and deemed sufficiently impregnable against any attack which the animal might make upon it, to effect its escape; but the next morning the captive was *non est*, having broken open its prison, under difficulties so great, and with a skill apparently so consummate, that the keeper was not less struck with astonishment than admiration at the animal's adroitness and sagacity, forgetting for a time the havoc and destruction it had previously committed amongst his young pheasants and poultry. After its escape it was never again seen in the neighbourhood, although for many months previous to its capture, it had been a constant resident in the locality. Smarting under its recent chastisement it had undoubtedly abandoned its adopted home to seek a more congenial and less dangerous rendezvous.

Although bold and fearless to a degree, the instincts of the pole-cat for self-preservation are so acute that were its character not so well known it might be considered a timid and fearful animal. Wary and keen of perception, it soon finds out the trapper's skill and deception, and flees from localities where they are plied as if from a pestilence, and hastens from, and in some instances, utterly deserts a covert, that has been drawn with dogs, though it may not have been personally molested or disturbed by their presence. Upon this hypothesis may be attributed the sudden appearance

and disappearance of *Putorius fœtidus* in certain localities and not to any love for a roving life, as may be supposed; for the animal entertains a decided partiality to a duly established locality, and seldom quits it of its own free will. When they are disturbed they will travel long distances from one rendezvous to another, not deviating much from a straight track, fording streams with great celerity, and surmounting other difficulties rather than adopt a more circuitous route. Of all our *mustelidæ* the pole cat is beyond doubt the most bloodthirsty and revengeful ; his *penchant* for a murderous career is so strongly developed in his nature, that no living creature unpossessed of a rebellious and retortive spirit, and strength to repel his attacks, can escape him. He metes out destruction and death to all such animals as have the temerity or misfortune to cross his path. Behold him under circumstances such as the following, and some idea may be formed of the insatiate cruelty and destructiveness of his nature. On a grassy knoll he is stretched at full length, basking under the heat of a noontide sun, and gorged, apparently to inanition with a leveret, the remains of which lie scattered around him ; near him is a rabbit's burrow out of which an unsophisticated but youthful scion of *Lepus cuniculus* emerges and unconscious of the near proximity of its implacable enemy, commences to crop the tender shoots of grass, till in an unlucky moment it reaches a point whence the air tainted with the exhalations of its body wafts its way to *Putorius fœtidus*, which, though semi-somnolent yet ever watchful, sniffs in the well known scent, when, with distended nostril and dilated pupil he suddenly pounces on the innocent victim, as would a smoked Cossack of the Ural upon a helpless Turk, and drives his canines deep into the brain, and the next instant returns to his former quiescent position, without even tasting the life blood of the slain animal. Witness this, and you would rank him as bloodthirsty a marauder as a " red man" of the Ohio woods, who used to scalp the pioneers seventy years ago.

In the farm yard he is infinitely more destructive than the fox, for while he is quite as daring and imbued with a cunning equal to Reynard, his smaller size and elasticity of body, give him the greater advantage, for he can insinuate himself into a hole little larger than that which an ordinary sized rat may enter. On reaching a hen roost on a predatory excursion, he will circumambulate the entire structure, searching for an easy means of entrance. If this fails him, he will seek for some aperture, and however, small it may be, he will speedily enlarge it to the required size, if such a mode of procedure be practicable, or, he will immediately climb to the roof, seldom desisting from his work of demolition without effecting his purpose

when woe betide the helpless inmates. One by one, they fall victims to his thirst for blood, and even before he commences to appease his voracious appetite, he will destroy more of animal life than would be sufficient to feed him sumptuously for a month. No life is spared by him—death is "meted out alike to all," from the tiny chick sheltering under its mother's wings, to the bold chanticleer who heralds in the morn with his matin note. This innate ferocity renders him, and justly so perhaps, obnoxious to the rearer of poultry, and preserver of game ; and the manifest falling off in their numbers amounting to a total banishment in many localities is to a great extent attributable to this fact ; for in such aversion is it held by these individuals, that whenever it is seen it is instantly pursued, and either killed, or driven to some less disturbed region. Notwithstanding, however, the continual warfare which the pole cat wages against animals subservient to man's use, he renders him in return—especially the farmer—a palpable service, inasmuch, as by his deadly and implacable enmity to the rat, he will quickly clear a farmstead of these destructive rodents ; indeed in such fear is he held by these grain destroyers that his presence amongst them is the signal for their immediate departure. I think if this were properly estimated by the farmer, and means were adopted by him to make his poultry roost secure against his nocturnal attacks, the service he does him in this way would more than counterbalance the evil and the loss complained of, and he would rather be encouraged to remain on, than be expelled from, their lands.

The peculiar odour which exhales from the body of the polecat, is very offensive and almost unbearable. That he has a voluntary and perfect control over this effluvium I think there can be little doubt, for if an individual be instantly killed, without previous provocation or intimation of danger, it will be found to exist to a very limited extent ; but, if on the contrary, it be first aroused, and subsequently dispatched, the fetid odour is always present, and is most pungent and disagreeable. This odour exhales from a thick, oily secretion contained in a small pouch placed near the tail. This strange provision in the economy of most of our *mustelidæ*, is probably accorded them as an additional means of defence, for it is well known to affect in a greater or less degree, the courage of dogs, which, as a rule, are unwilling to attack a weasel, stoat, or pole cat, in which this odour most abounds. The colour of the pole cat varies according to the seasons—not that the hair itself changes colour, but because the coat is composed of inner fur of pale yellow through which springs the long glistening brown hairs, forming the exterior surface so well known to limners in the fine arts, in the construction of the Fitchet brush. Thus, in the winter season, when the entire covering of the animal is in its

fullest perfection the inner fur to a great extent is hidden by the glossy luxuriant outer hair, and he then appears a deep rich Vandyke brown ; but in the summer when he casts off his winter dress, the pale yellow of the inner fur shines through the outer, and he then becomes very much lighter in colour and much less handsome in appearance. Its fur is profuse and ample, and forms a good protection against cold, with which even in the most rigorous winter the animal seems but little affected. The food of the pole cat is extremely variable and is not confined to terrestrial game alone ; for it will greedily devour frogs and toads; rabbits and hares, however, are its staple diet, both of which it captures with impunity ; either by a stealthy approach, as they remain at rest in their " forms" or by hunting them down by scent. So indomitable and enduring is the polecat, and so acute and unerring are its olfactory organs, that when it is once fairly on the scent of a hare it never yields or gives up the pursuit, but follows its quarry with marvellous precision throughout all its devious wanderings until it becomes exhausted and falls an easy victim. It also preys on pheasants, partridges and other ground roosting birds,—a pair of pole cats, male and female, will occasionally consociate and act in concert in the pursuit of prey, evincing consummate skill and cunning in their joint endeavours—a hare or rabbit thus pursued will quickly abandon all attempts to escape, and will squat on the ground, and remain on the spot as if transfixed to it by some peculiar fascination awaiting in despair its "inevitable doom." I have witnessed two instances of this influence which the pole cat and a few others of its congeners are capable of exercising over their prey. One in Chillingham Park and the other in the immediate vicinity of Alnwick, and in both instances the animals were killed.

The pole cat is not by any means unprolific ; but produces as many as five, and in some instances six young at a litter, which make their appearance abroad usually in the beginning of June. The nest is formed in any convenient but defensible hole or cranny—in the interstices of rocks, and sometimes in deserted rabbit burrows, particularly those which are protected by the gnarled roots of trees—it is composed of various soft leaves and moss padded together with great minuteness and care, forming a warm and smooth bed for the young. The female is very affectionate to her offspring and looks after their necessities and weal until they become almost of adult size, and possess the capabilities of their parents. In general appearance the pole cat greatly resembles the pine martin, but is much less in size, never exceeding two feet in length, and seldom weighing above twenty-eight ounces.

Alnwick, October, 1865.

A NORFOLK RAMBLE.

By T. E. Gunn.

On Monday, the 7th of August last, I started, in company with my father, about 9 a.m., for a day's ramble in the vicinity of Hethersett. We passed on our way through the villages of Eaton and Cringleford, where we noticed the Martin, *Hirundo urbica*, somewhat numerous, busily engaged in following its aerial pursuits over the meadow land near the old bridge—individuals now and then stayed to rest themselves on the telegraph wires, that skirted one side of the road, darting off again to resume their evolutions. After a short pause, sometimes perhaps as many as forty or fifty individuals would occupy the wires at the same time, forming a row of a hundred yards or more, which appeared quite an interesting sight. Passing through the toll gate at Cringleford, we directed our course along a bye-road, and as we strolled along we were much gratified with the magnificent scenery and the melodious chorus of voices that fell upon the ear. Both sides of the road for about two miles were bordered with furze bushes, and the common brake, intermingled with wild flowers and shrubs in great profusion, over which sported a numberless multitude of the insect world, the whole appearing a very beautiful and interesting sight to the beholder. Amongst the various species of diurni, I noticed *Satyrus Ægeria*, *S. Megœra*, *S. Janira*, *S. Tithonus*, *Chortobius pamphilus*, *Lycœna Alexis*, and *Polyommatus phlœas*, to be very abundant. Still walking on I espied a pale cream coloured individual of the robin, *Sylvia rubecula*, hopping and picking near the foot of an old tree, a few yards in front of us, it however glided through the hedge and disappeared on our nearer approach ; we did not meet with anything else of particular note until we arrived at our friend's residence, which is pleasantly situated on the edge of a wood ; here we refreshed ourselves for awhile and commenced our ramble through the woods, we however parted company each pursuing a separate course. I passed along a narrow foot-path leading through the centre of the woods, each side of which was planted with a row of young fir trees ; on their branches I observed several individuals of the Cole-tit, *Parus ater*, busily engaged in following their industrious pursuits, winding and twisting themselves around the boughs, and hopping from twig to twig, examining the crevices in search of insects and seeds, which principally constitute their food, uttering at intervals of a few seconds their pleasant and well known notes, which seemed to resound

from one end of the wood to the other. The call note of the male (as well as I am able to pronounce it,) is, Twa, Twit-it, Tweetee, Tweetee, Tweetee, Tweetee, that of the female, Tweet, Tweet, Tweet, in a softer and lower key. Looking upwards, the swallows, *Hirundo rustica*, seemed enjoying themselves in pursuit of their usual aerial evolutions with unwonted activity; their pointed wings and tails, and the beautiful glossy hue of their plumage, appearing gloriously in the sunshine. My friend informs me that a pair of swallows have taken up their abode under the eaves of his dwelling for several years past, regularly making their first appearance during the first week in April; I might here also observe that the *Hirundinæ* in general appear scarcer this season compared with that of previous years. The Swift, *Cypselus apus* on the contrary, however, appears to be more plentiful. But, returning to my ramble, myriads of insects met my gaze every few steps I took, such a profusion indeed, as I have failed to observe for several years past; it is, as far as my experience goes, one of the most prolific seasons for the insect world in general that has occurred for many years. Still walking on I saw a cluster of seven or eight fir trees, to which I wended my way, and took my station quietly at the foot of one, to watch the actions of my little favourite, the Gold Crested Wren, *Regulus cristatus*, which inhabits these firs all the year through, breeding therein in the summer; after patiently waiting a short time, I espied an individual or two, peering cautiously through the branches, and doubtless perceiving no enemy near, recommenced their pursuits, from which no doubt my first appearance there had disturbed them, they were soon joined by others, and in a short time the trees seemed quite alive with their graceful movements and pleasant harmony. To see them turning and winding their little bodies about the branches, now above, and then underneath, and in a great variety of other ways is indeed quite amusing. Presently an individual may be observed perched behind one of the dead-apples (as they are commonly called here) and thrusting its tiny beak amongst the crevices in search of its food, which consists chiefly of various seeds and minute insects, every now and then he will pause in his work, to glance cautiously around with his beautiful bright little eye, and, if satisfied with his search, will resume his occupation with greater ardour and zeal than ever. Should you chance to disturb them, they will quickly disappear amongst the foliage of the tree, or sometimes flutter to another a short distance off. I also observed the Cole Tit, *Parus ater*, and the Long-tailed Tit, *Parus caudatus*, in their company; all seemed to agree admirably well, mingling their sweet little voices. Sometimes in fluttering from branch to

branch of the tree under which I stood, individuals would pass within a foot or two of my face. Seeing a fine example of *Parus ater*, seated on a twig on the next tree, and requiring one for a friend, I took aim with a small walking-stick gun I happened to have with me, and fired, killing the poor unsuspicious little victim on the spot. The report of my gun which sounded rather loud in the woods, however, did not seem to disturb them very much. Stillness reigned throughout the whole community for perhaps a minute, when they again broke out with their melodious chirping and harmony, and commenced their various pursuits afresh, as if nothing had occurred. Resuming my walk, I heard the notes of various songsters of the feathered tribe, including the Chiff Chaff, *Sylvia rufa*, Willow Warbler, *Sylvia trochilus*, the Robin, *Sylvia rubecula*, the Blackbird, *Turdus merula*, the Chaffinch, *Fringilla cælebs*, and various species of the *Parinæ*, mingling in pleasant confusion. Now and then, above the tops of the trees, might be heard the harsh caw caw of the rooks, as they passed on their way to and from the rookery, which is situated on the same estate, about half a mile distant from the wood in which I was. This wood is composed partly of hazel or nut bushes and here that pretty little animal the Squirrel, *Sciurus europæus*, abounds in tolerable plenty. I have often watched them running along the ground, which they do with great speed; should the attempt be made to follow it, it is quickly lost to sight; but after a careful close search it may be discovered clinging close to the trunk of a fir tree which they mostly prefer, occasionally nearly at the top, sometimes between the forked branches, where by clinging close they hope to secure themselves from the searching and destroying propensities of their chief enemy, man. I heard the discordant notes of the Jay, *Corvus glandarius*, at intervals throughout the day. The Creep-tree or Creeper, *Certhia familiaris*, also amuses one much by its peculiar mode of searching for its food. It will begin its examination of a tree at the very base and wend its way upwards by passing round and round the trunk in the manner of a corkscrew, so to speak, until it reaches the top, making a most careful examination of all the crevices and loose pieces of bark in its course, by thrusting in its slender curved beak, and helping itself to the insects and minute seeds that may be secreted therein. When it is thoroughly satisfied with its search, it will take flight to the next tree, and go through the same course of procedure. The note of the Creeper somewhat resembles that of the Goldcrest but is a key louder. The Turtle dove, which also breeds here, appears to be quieter than a month ago when I happened to visit the same locality.

I took a nest of young birds there three years ago, and reared them up, but one unfortunately made its escape as soon as it gained sufficient power of wing. The other I have still in my possession, and it is very tame. Towards the close of the afternoon and throughout the evening, the tap, tap of the Green Woodpecker, *Picus viridis*, was heard resounding over the woods. After again refreshing ourselves, we started for home, which we reached about nine in the evening after spending a very pleasant day.

PLANTS FOUND ON THE MAGNESIAN LIMESTONE, NORTH OF PONTEFRACT, 1865.—Second Contribution.*

By Geo. Roberts.

Clematis Vitalba. Near Allerton Bywater, in disused lime quarry. Rare, in Yorkshire as a truly wild plant.
Helianthemum vulgare. Kippax.
Viola odorata. Allerton, Ledstone. Very frequent.
V. hirta. Growing with the above. Common.
Linum usitatissimum. Burton Salmon, waste ground.
Malva moschata. Sherburn churchyard.
Hypericum hirsutum. Kippax and other places. Common.
H. montanum. Fairburn. Frequent about Kippax.
Euonymus Europæus. Near Ledstone, not frequent.
Genista tinctoria. Near Monk Frystone.
Anthyllis vulneraria. Brotherton, in old quarries.
Medicago sativa. Near Monk Frystone ; two or three plants.
Astragalus glycyphyllos. Burton Salmon in two places.
Lathyrus sylvestris. South Milford in disused quarry.
Rosa spinosissima. Ledsham.
Sanguisorba officinalis. Common.
Poterium Sanguisorba. Kippax and other places.
Eupatorium cannabinum. Birkin.
Erigeron acris. Brotherton.
Inula Conyza. Brotherton.
Campanula latifolia. Birkin.

The former list appeared in *Naturalist* Vol. i. p. 255.

Verbascum Thapsus. Burton Salmon in disused quarry.
Veronica Anagallis. Common in ditches.
Linaria Elatine. Footpath between Burton Salmon and Hillam.
L. minor. Frequent in cultivated fields.
Salvia verbenaca. Near South Milford.
Galeopsis Ladanum. Frequent.
G. Tetrahit. Common.
G. versicolor. Near Birkin in cultivated fields.
Nepeta Cataria. Kippax.
Lithospermum officinale. Near Ledsham.
Lysimachia vulgaris. Brook side, Birkin; not frequent.
Polygonum hydropiper. Common in ditches. Linneus says that all domestic quadrupeds reject this plant, and that when gathered in full blossom and dried it preserves wardrobes and other places from the attacks of insects.
Daphne laureola. Near Allerton Bywater.
Orchis pyramidalis. Near Sherburn.
Colchicum autumnale. Aire side between Knottingley and Beal; abundant in one spot.
Asplenium Ruta-muraria. Walls of Monk Frystone Church.

PLANTS FOUND AT OR NEAR LOFTHOUSE, ON THE SANDSTONE, 1864-5.

By Geo. Roberts.

Ranunculus sceleratus. Aire side, Methley.
Berberis vulgaris. Oulton, Rhodes Green.
Papaver Argemone. On the edge of a railway cutting Lofthouse.
P. somniferum. One or two plants growing on the edge of a railway cutting Lofthouse.
Escholtzia californica, D.C. Cornfields, Lofthouse; one specimen. This common and hardy annual readily reproduces itself.
Reseda luteola. Stanley.
Viola palustris. Lofthouse.
Silene noctiflora. Lee Moor on gravelly soil.

Stellaria Holostea. Ardsley.
Cerastium aquaticum. Aire side, Methley.
Linum usitatissimum. Lofthouse, Methley.
Malva moschata. Lofthouse, Oulton.
M. rotundifolia. Rhodes Green.
Hypericum humifusum. Lingwell Gate.
H. pulchrum. Rhodes Green.
Rhamnus catharticus. Lofthouse.
Melilotus vulgaris. Lofthouse.
M. officinalis. Lofthouse, frequent.
Lotus major. Lofthouse.
Vicia sativa, var. *angustifolia.* Lofthouse.
Orobus tuberosus. Stanley and other places, common.
Agrimonia Eupatoria. Lofthouse.
Aremonia agrimonoides. Canal side between Stanley and Methley.
Rosa villosa. Rhodes Green.
Sanguisorba officinalis. Frequent.
Circœa lutetiana. Ardsley.
Bryonia dioica. Rhodes Green and other places.
Chrysosplenium oppositifolium. Ardsley.
Centauria Cyanus. Lofthouse, in fields not very common.
Bidens cernua. Canal side Stanley.
Gnaphalium uliginosum. Common.
Pulicaria dysenterica. Oulton, &c.
Chrysanthemum segetum. Lee Moor.
Anthemis arvensis. Lofthouse, a single specimen.
Campanula latifolia. Lofthouse.
Vinca minor. Ouzlewell Green, scarcely wild.
Erythræa Centaurium. Lofthouse, not very frequent here on the sandstone.

I have found none of the Gentians in my immediate neighbourhood.

Cuscuta Trifolii. Lofthouse, in clover.
Pedicularis sylvatica. Ardsley.
Linaria minor. In cultivated fields, rather frequent.
Stachys Betonica. Common.
S. arvensis. Lofthouse.
Scutellaria galericulata. Lofthouse.
Cynoglossum officinale. Methley, a single specimen.
Echium vulgare. Lofthouse, not frequent.

Chenopodium rubrum. Methley.
C. Bonus-Henricus. Ouzlewell Green, Lee Moor.
Humulus Lupulus. Lofthouse gate, Rothwell Haigh.
Epipactis latifolia. Ouzlewell Green.
Habenaria viridis. Lofthouse.
Galanthus nivalis. Small wood near Thorp.
Polypodium Dryopteris. Lofthouse, a very small bed.
Blechnum spicant. Ardsley and Thorp woods.
Ophioglossum vulgatum. Lofthouse. Abundant in pastures at Ouzlewell Green, growing in beds like lettuce. The cows crop it off along with the grass. The taste of the leaf is not unpleasant.

Lofthouse, Wakefield.

Reports of Societies.

Richmond and North Riding Naturalists' Field Club.—The monthly meeting of this society was held on Tuesday, October 11th, the President, Mr. Wood, F.G.S., in the chair. The President exhibited a beautiful series of *trilobites* from the Upper Silurian rocks of Dudley. The state of preservation of these remains was most wonderful, the eyes of some species being quite perfect, and as the eye is exactly the same as that of the allied crustaceans that inhabit the same zone in our present seas, it proves that the light on our globe at the time of this long past period was the same as now. The President also exhibited a fine series of fish teeth from the Carboniferous Limestone quarries at the Gallow Fields, Richmond; the cast of an egg, and a large and carefully made drawing of the extinct monster the wingless bird of New Zealand *Æpyornis maximus* and by the side of the egg was placed one of the recent ostrich; the pigmy proportion of our largest bird's egg showing as about a twelfth of the bulk of this mighty dweller in the forests of a former world. This bird reached the height of upwards of twelve feet. A boulder, with ice scratches, enabled the President to again explain the peculiar features of our land during the glacial period. A set of flint and stone implements from the drift were laid on the table, together with a fine set of plans of the Newton Cap colliery, which the members of the club, through the kindness of their worthy President, lately visited. The above are for the present in the museum, and are well worthy of attention. The Secretary exhibited a specimen of the northern stone crab, *Cancer horridus*, taken at Redcar in March last; also a half groat of Henry VII, found near the Mill Lane. Mr. W. S. Robinson exhibited a large gold coin of James I, together with a groat of Henry VIII. Mr. R. Smith, of Richmond, was elected a member of the club, after which the proceedings terminated. The meeting then adjourned to the second Tuesday in November.—James Aspdin, Hon. Sec.

Observations.

Royal College of Surgeons.—A skeleton of that rare and singular animal the Aye-aye, or Chiromys, has been lately added to the Hunterian Museum. It is an inhabitant of the island of Madagascar, where it was first discovered by Sonnerat about the year 1780. The specimen brought home by that traveller, and presented by him to the celebrated French naturalist, Buffon, has remained until within a few years the unique representative in Europe of this remarkable creature. By Cuvier, and many other zoologists, it was considered as a member of the Rodent order, on account of the conformation of its teeth resembling those of the gnawing animals; but De Blainville and others, laying more stress upon the character of the limbs, placed it among the Lemurine-quadrumana, or monkey-like animals. This view has been completely confirmed by the dissection of a specimen recently sent to Professor Owen by Dr. Sandwith, a fully illustrated account of which will be found in the "Transactions of the Zoological Society," for 1863. A living example is now in the Regent's Park Gardens, but, as it is purely nocturnal in its habits, it is rarely seen by visitors. A stuffed specimen has lately been presented to the University of Cambridge by Mr. A. Newton. Besides those above mentioned, very few examples of this rare animal have as yet been received in Europe. The skeleton just added to the College Museum was discovered in the possession of a dealer in objects of natural history in Paris, by Mr. Flower, the indefatigable conservator, who at once secured it, at the expense of £20, for the collection with which he is so deservedly connected.

Indian Summer.—The unusually warm or, I might almost say hot, season just passed by, has produced many unusual facts and appearances both in animate and inanimate nature—of the former I saw on Saturday last, 8th of October, the nest of a Yellow-hammer, *Emberiza citrinella*, from which had just been taken three eggs—the nest was carefully and beautifully made as if by adult birds. Are we to attribute this to the present remarkable season, which has brought us second crops of peas, strawberries, and other equally unusual phenomena. At the Microscopic Soiree, of the Huddersfield Literary and Scientific Society on Monday last, I was shown a spray of bloom plucked from a pear tree, near Mirfield, which was at the same time bearing fully ripened fruit.—Wm. Eddison, High-street, Huddersfield, October 13th, 1865.

A Butcher Bird, or Great Shrike was taken alive in the Market place of Wick, on Monday, 9th of October instant.—Although included by Pennant, Edwards, and Willoughby, among our English birds specimens having been taken in the northern counties, the Sentinel Shrike, the *Lanius cinereus* of Gesner and Aldrovandus, the *Lanius excubitor*, of Linnæus, is properly a native of Norway and Sweden and is but seldom met with even in the most northern parts of Great Britain, including the Orkney and Shetland Islands.

Chœrocampa celerio.—Another specimen of the rare *Chœrocampa celerio* has just been found in this neighbourhood. It was brought by a boy (who found it among the grass) to Mr. Brown, birdstuffer, and subsequently came into my possession.—F. Buchanan White, M.D., Perth, October 26th, 1865.

Grimmia commutata, Hueb.—In July 1864, Dr. Stirton of Glasgow, discovered on Moncrief Hill, near Perth, *Grimmia commutata*, Hueb., a moss new to Britain. I have several times examined Moncrief Hill, but have not been fortunate, (or perhaps sharp-eyed enough) to detect the new *Grimmia*. On October 20th I went to Stenton Rocks, near Dunkeld, the well known station for *Asplenium germanicum*, and *A. Septentrionale*, (which last named is still

abundant there) and discovered *Grimmia commutata* in company with *G. leucophæa*, *G. trichophylla*, and a form of *G. Doniana*. *G. commutata*, Hueb. belongs to the section *Commutatæ* of the genus *Grimmia* in Bry. Eur. and is alluded to in Bry. Brit. at p. 161. It is *Dicranum ovale*, Hedw., and is *dioicous* (the fruit has not yet been found in Britain), and has leaves with *inflexed* margins. On Kinnoull and Moncrief Hills I have discovered another *Grimmia*, which Mr. Wilson informs me may be *G. alpestris*, Schw., a species new to Britain; I shall however say nothing more of this at present. I shall have much pleasure in sending a specimen of *G. commutata* to any botanist.—F. BUCHANAN WHITE, M.D., Perth, October 26th, 1865.

News.

Massacre of Small Birds in France.—At a recent agricultural meeting in France, the Archbishop of Bordeaux (Cardinal Donnet) gave some statistical details in order to show the injury done to the agriculturist by the wholesale massacre of small birds; it was formerly calculated that in spring time there was no less than 10,000 bird's nests in each square league. Now we know that every nest contains on an average four young ones. Well, then, it has been shown that each of these little ones requires for its daily consumption 15 worms, and that the parents require for their share 60; making a total of 120 insects for the daily consumption of each nest. If you multiply 120 worms by 10,000 nests, you have a total of 1,200,000 worms destroyed every day, or 36,000,000 in a month. 36,000,000 worms! Have you reflected that those 36,000,000 worms, if you do not respect the existence of these poor birds that comsume them, will in turn eat up the leaves, the flowers, and the fruits of our trees as well as the produce of our kitchen gardens. Neither should we forget that the insects and the parasitic plants of which these birds would rid us, levy an impost nearly double the property tax. Bear in mind that the present year the caterpillars have done such damage to the cabbages that this vegetable has disappeared from our tables, and that these insects have been equally in the pine woods."

The Domestication of Bees and Hawks in England.—The domestication of BEES was attempted early in the seventh century. The clergy earnestly encouraged it, teaching that bees "had been sent from heaven, because the mass of God could not be celebrated without wax." About the middle of the tenth century, slaves whose duty it was exclusively to attend to bees, and were called beesherds, were ordinarily attached to wealthy establishments; and from the position of slaves they soon became servile tenants, whom their lords provided with a stock of bees, for which they paid a fixed amount of produce for life, the swarms continuing the property of the lord. We also find about this time the Anglo-Saxon word *bee cest* (bee chest) and the Latin *alvearia* (beehives) usually substituted for "*rusca*," from which it may be inferred that these rough constructions were superseded by regular hives. Not long afterwards the clergy induced Edward the Confessor to tithe beehives—an evidence that they had become numerous and valuable, which is confirmed by "Domesday Book," where they are repeatedly mentioned. The first mention of HAWKS occurs in documents of the eighth century, when two falcons were sent by Boniface, Bishop of Mons, to Ethelbert, King of Mercia, which induced a Kentish king to apply to the same prelate for a similar present, and, in doing so, he stated that he could not obtain hawks of the quality he required in his own kingdom. From about this time the kings and nobles laboured to domesticate hawks, though at first in very limited numbers, and with no great skill. They formed, nevertheless, a regular part of their establishment. In the tenth century the custom of more completely training them was introduced, and

many persons kept them through the summer, that they might be ready for the winter.—*Natural History Review*, 1865.

The *Journal de Fècamp* states that since the 1st of September fifteen small boats belonging to that port have brought to market a million of oysters, which were all eagerly bought up for consumption in Paris.

Exchange.

Lepidoptera.—I have duplicates of the following insects in good condition for exchange :—*H. Semele, P. Adonis, G. C-Album, N. Zonaria, A. fuliginosa, A. tritice, R. sanguinalis.* Offers of exchange to be addressed—Mr. W. Letto, Messrs. Cook and Townshend, Byrom-street, Liverpool.

Duplicates—S. tiliæ, S. populi, H. velleda, A. villica, O. gonostigma, L. lithargyria, N. fulva, O. Ypsilon, A. rufina, H. chenopodii, F. porata, A. strigillata, T. juniperata, L. cæsiata, A. flammealis, and a few others. Address :—J. P. Barrett, 16, Frederick Road, Lorrimore-square, London, S.

Shells :—*Cyclas pallidum.* Fine specimens for any of the following : *Bithinia Leachii, Valvata cristata, Assiminia Grayana, Helix pomatia, H. cantiana, H. Carthusiana, H. hybrida. H. pisana, H. obvoluta, H. revelata, H. sumelleta, H. aculeata*, or any of the genus *Pupa, Clausilia laminata, C. biplicata, Achatina acicula, Lymneus glutinosa*, any *Conovolus, Cyclostoma elegans* or fine specimens of any other shell. Address: H. Hutchinson Church-lane Brighouse.

Original Articles.

THE VEGETATION OF SPITZBERGEN COMPARED WITH THAT OF THE ALPS AND PYRENEES.

By Chas. Martins,

Prof. of Natural History, and Director of the "Jardin des Plantes," &c., at Montpellier.

(Continued from page 141.*)*

Let us now examine the Flora of another locality equally well circumscribed, but which is found under very different conditions to that of the Faulhorn ; this is the Jardin of the Mer de Glace of Chamounix. I know of no other locality in the Alps which better recals the aspect of Spitzbergen than the grand circle of *névé* of the Mer de Glace in the midst of which is found the lawn known by the name of *Courtil* or *Jardin.* The Aiguille du Moine and the Aiguille Verte, the Tour des Courtes, and the Aiguilles of Triolet and Lechaud, surround it on all sides ; the great glacier of the Talefre fills it at the bottom. If by imagination the traveller, standing on the Jardin, should suppose the sea to wash the foot of the amphitheatre on

which he occupies the centre, he would have a good idea of one of the aspects of Spitzbergen. The islet, uncovered by the snows, on which he stands is an additional analogy, and the comparison of the flora of this islet with that of Spitzbergen, is one of the most legitimate and interesting that can be made. Pictet and J. D. Forbes have found that the *Jardin* is 2756 metres (9040 feet) above the level of the sea ; it is 800 metres (2624 feet) long, and about 300 metres (1084 feet) wide ; its distance from the nearest rocks where a number of plants are found is 800 metres (2624 feet) at least. The Jardin is a group of protogine rocks, polished and striated, forming the angle between the two affluents which form the Glacier of the Talefre ; the first and largest, descends from the portion of the circus comprised between the Tour des Courtes and the *Aiguilles* of Triolet and Lechaud ; the second and smaller proceeds from the Aiguille Verte and that of the Moine. Two moraines flank these rocks, the one on the left being the largest ; a spring rises from the middle of the lawn and forms a small rivulet. The detritus of the moraine has been, little by little, covered with plants and converted into a carpet of verdure, which contrasts singularly with the white *névé* which surrounds it. My friend M. Alph. de Candolle has collected into a special herbarium the plants found in this locality gathered by different travellers who have successively visited the place, in the following monthly order :—I have botanised here on the 24th July, 1846; Mr. Percy of Edinburgh, 26th July, 1836 ; Mdlle. d'Angeville, 3rd August, 1838 ; M. H. Metert of Geneva, 8th August, 1817 ; M. Alph. de Candolle, 12th August, 1838 ; and lastly M. Venance Payot of Chamounix, has also visited the spot several times, and in 1838 published a catalogue of the plants found there. I have seen nearly the whole of them in the herbarium of M. de Candolle at Geneva, and have verified their names and synonymy in October 1854, with M. Muller, curator of the herbarium. We may consider this *flora* to be as complete as that of the Faulhorn, and in the annexed list, those marked with an * are found in Northern Lapland, and those in italics on the Faulhorn :—

Phanerogamia of the Jardin de la Mere de Glace at Chamounix.

Ranunculaceæ. *Ranunculus glacialis*, * L. ; *R. montanus*, * Willd. ; R. Villarsii, D.C.

Cruciferæ. *Draba frigida*, Gaud. ; *Cardamine bellidifolia*, L. * ; C. resedifolia, L. ; Sisymbrium pinnatifidum, D.C.

Caryophyllaceæ. Silene rupestris, var. sub-acaulis L. ; *S. acaulis*, L. * ; *Spergula saginoides*, L. ; Arenaria rubra, L. ; A. serpyllifolia, L. ; A.

nivalis, Godr. ; *A. biflora*, L. * ; *Cherleria sedoides*, L. ; *Stellaria cerastoides*. L. ; *Cerastium latifolium*, L. * ; C. alpinum, D.C. ; * var lanatum ; *Spergula saginoides*, L. *

Papilionaceæ. Trifolium alpinum, L.

Rosaceæ. *Sibbaldia procumbens*, L. * ; *Geum montanum*, L. ; *Potentilla aurea*, L. ; *P. glacialis*, Hall. ; *P. grandiflora*, L. ; *Alchemilla pentaphylla*, L.

Onagraceæ. *Epilobium alpinum*, L. *

Crassulaceæ. *Sedum atratum*, L. ; *S. repens*, Schl. ; S. annuum, L. * ; Sempervivum montanum, L. ; S. arachnoideum, L.

Saxifragaceæ. *Saxifraga stellaris*, L. * ; S. aspera, L. ; *S. bryoides*, L.

Umbelliferæ. Meum mutellina, Gaertn. ; *Gaya simplex*, Gaud. : Bupleurum stellatum, L.

Synantherеæ. Cacalia alpina, Jacq. ; C. leucophylla, Willd. ; *Tussilago alpina*, L. ; *Erigeron uniflorus*, L. * ; *E. alpinus*, L. * ; *Pyrethrum alpinum*, Willd. ; *Omolotheca supina*, Cass. * : Gnaphalium dioicum, L. * ; G. alpinum, Willd. * ; Arnica montana, L. ; Senecio incanus, L. ; *Cirsium spinosissimum*, Scop. ; Leontodon squammosum, Lam. ; *L. aureum*, L. ; Taraxacum lævigatum, D.C. ; Hieracium alpinum, L. * ; H. angustifolium, Hoppe. ; H. glanduliferum, Hoppe. ; H. Halleri, Vill.

Campanulaceæ. *Phyteuma hemisphericum*, L. ; Campanula barbata, L.

Primulaceæ. Primula viscosa, Vill.

Gentianaceæ. Gentiana purpurea L. ; G. acaulis, L. ; G. excisa, Presl.

Scrofulariaceæ. *Linaria alpina*, D.C. ; *Veronica alpina*, L. * ; *V. bellidioides*, L. ; *Euphrasia minima*, Jacq.

Plantaginaceæ. Plantago alpina, L.

Salicaceæ. *Salix herbacea*, L. *

Junceaceæ. *Juncus Jacquini*, L. ; J. trifidus, * L. Luzula lutea, D.C. ; *L. spadicea*, D.C. ; *L. spicata*, D.C. *

Cyperaceæ. *Carex curvula*, All. ; *C. fœtida*, Vill ; *C. sempervirens*, Vill. C. ferruginea, Scop.

Graminaceæ. *Phleum alpinum*, * L. ; Anthoxanthum odoratum, L. ; *Agrostris rupestris*, * All. ; *A. alpina*, Scop. ; *Avena versicolor*, Vill. ; *Poa laxa*, Haencke. ; P. laxa var. flavescens, Koch ; *P. alpina*, * L. ; *P. alpina*, var. *vivipara*, L. ; *Festuca Halleri*, All.

There are then eighty-seven Phanerogamia at the Jardin ; to these must be added sixteen mosses, two hepaticæ, and twenty-three lichens, making a total of one hundred and twenty-eight plants growing on this green islet, surrounded by eternal snow.

Of the eighty-seven flowering plants there are fifty printed in italics found also on the Faulhorn. Now, the latter being an isolated summit opposite the Bernese Alps, the other an islet, in a circle forming part of Mont Blanc, and consequently under very different physical conditions, we may conclude that these two Florulæ are a good representation of the Alpine vegetation at its highest limit below what is commonly called the eternal snows. Amongst these eighty-seven species we only find five which make a portion of the Spitzbergen Flora, viz :—*Ranunculus glacialis. Cardamine bellidifolia*, *Cerastium alpinum*, *Arenaria biflora*, and *Erigeron uniflorus*, about the same proportion as we have at the Faulhorn ; but there are twenty-four which are found in Lapland. To sum up, the summit of the Faulhorn and the Jardin have fifty plants in common. The proportion of Lapland species is thirty per cent. on the Faulhorn, and twenty-eight per cent. at the Jardin, or about a third of the whole ; but in both localities the Spitzbergen plants only form five per cent. of the total number. Let us also repeat that none of these plants belong to the arctic or circumpolar flora. This flora of the Alps (of a lower altitude than the eternal snows) corresponds then to that of Northern Lapland, in the environs of Altenfiord, for example, * so that in order to find a vegetation analogous to that of Spitzbergen, we must ascend still higher in the Alps, above the snow limit.

In the midst of the glaciers on the northern side of Mont Blanc, is a small chain of isolated rocks, forming an islet in the midst of the icy sea, which surrounds them. At their highest part, they separate the glaciers des Bossons from that of Taconnay ; are 800 metres (2626 feet) above the Montagne de la Côte, and two kilometres (6560 feet) from the Pierre de l'Echelle, the two nearest points where any vegetation is found. They run from N.N.E. to S.S.W. and their lowest point is 3050 metres (10,014 feet) above the level of the sea ; their highest, called by De Saussure " Rocher de l'heureux Retour," is 3470 metres (11,393 feet). These rocks are formed of vertical layers of schistose protogine, amongst which the plants find shelter and soil for their growth formed by the decomposition of the rock. The ascents of Mont Blanc by Marckam Shervill, 27th August, 1825 ; Auldjo, 8th August, 1827 ; and Martin-Barry, 17th September, 1834, fixed the number of plants then known to grow here at eight. I have visited the place three times,—the 31st July, 1844,—2nd September, 1844,—28th July, 1846,—and I explored principally, and not without peril, the escarp-

* See my " Voyage botanique le long des Côtes septentrionales de Norvege" ; and Anderson " Conspectus vegetationis Lapponicæ," 1846.

ment turned towards the south-west, looking over the chaos of *seracs* of the glacier des Bossons. I gathered nineteen species. M. Venance Payot of Chamounix, made a fresh ascent to these rocks on the 30th August, 1861, and then found five species which I had not remarked. I give below a list of these twenty-four plants, of which five printed in italics, belong also to the Flora of Spitzbergen. At the Grands Mulets, as we shall see, the proportion of Spitzbergen plants is twenty-one per cent., and with the exception of *Agrostis rupestris*, there is not a single Lapland species. This *florula* is then composed of species exclusively *super-alpine* (très-alpine)mixed with a fifth of Spitzbergen plants. The Grand Mulets is one of the highest stations of a rodent (*Arvicola nivalis*, Mart.), the Snow Vole, which derives its nourishment from the plants found in our list. M. Payot has besides gathered at the Grands Mulets, twenty-six mosses, two Hepaticæ and twenty-eight lichens * giving a total of eighty species of plants on these apparently barren rocks.

PHANEROGAMIA OF THE GRANDS MULETS.

Draba fladnizensis, Wulf. ; D. frigida, Gaud.

Cardamine bellidifolia, L. ; C. resedifolia, Saut.

Silene acaulis, L. ; Potentilla frigida, Vill.

Phyteuma hemisphericum, L. ; Pyrethrum alpinum, Wild. ; *Erigeron uniflorus*, L. ; Saxifraga bryoides, L. ; S. Grœnlandica, L. ; S. muscoides, Aut. ; *S. oppositifolia*, L. ; Androsace helvetica, Gaud. ; A. pubescens, D.C. ; Gentiana verna, L.

Luzula spicata, D.C. ; Festuca Halleri, Vill. ; Poa laxa, Haencke. ; P. cæsia, Sm. ; P. alpina, var. vivipara, L. ; *Trisetum subspicatum*, P. Beauv, ; Agrostis rupestris, All. ; Carex nigra, All.

Let us now see if our law is confirmed on Monte Rosa. During a sojourn of fourteen days, from the 13th to 27th September, 1851, in the cabin of Vincent, on the southern side of Monte Rosa, and at an elevation of 3,158 metres (10,368 feet), M.M. A. and H. Schlagintweit gathered, around this station, on the Gneiss, forty-seven species of Phanerogamia, of which ten (in italics in the subjoined list) form a part of the flora of Spitzbergen.

PHANEROGAMIA OF THE ENVIRONS OF THE CABANE DE VINCENT ON MONTE ROSA.

Ranunculus glacialis, L. ; Hutchinsia petræa, R. Br. ; Thlaspi cepæfolium, Koch. ; T. corymbosum, Gaud. ; T. rotundifolium, Gaud. ; *Cardamine*

* See *Naturalist* vol. ii. p. 206.

bellidifolia, L. ; *Silene acaulis*, L. ; Cerastium latifolium, * L. ; Cherleria sedoides, L. ; Potentilla alpestris, Hall.

Saxifraga aizoides ; S. bryoides ; S. biflora, All. ; S. exarata, Vill. ; S. muscoides ; S. *oppositifolia* ; S. retusa, Gouan ; S. stellaris, L. ; Achillæa hybrida, Gaud. ; Artemisia mutellina, Vill. ; A. spicata, Wulf. ; Aster alpinus ; Chrysanthemum alpinum. *Erigeron uniflorus* ; Phyteuma pauciflorum L. ; Myosotis nana ; Linaria alpina ; Veronica alpina ; Gentiana verna ; G. imbricata, Froehl. ; Androsace glacialis, Hoppe ; Primula Dyniana, Lgasca. ; *Oxyria digyna* ; Salix herbacea * ; *S. reticulata.*

Agrostris rupestris,* All. ; *Trisetum subspicatum*, P. Beauv. ; Festuca Halleri, All. ; F. ovina ; Poa alpina ; P. laxa, Haencke ; P. minor, Gaud. ; Kœhleria hirsuta, Gaud. ; Elyna spicata, Schrad. ; Luzula spicata, * D.C. ; Carex nigra, All.

The proportion of Spitzbergen plants is thus a fifth, the same as at the Grands Mulets, and *Cerastium alpinum*, *Salix herbacea*, *Luzula spicata*, and *Agrostis spicata*, are the sole Lapland plants strangers to Spitzbergen. The remaining thirty-three species are exclusively alpine.

On the highest point of the pass of St. Theodule, which leads from the Valley of Zermatt, in the Valais, to the Val Tournanche in Piedmont, is also found an islet uncovered by snow, but closely surrounded on all sides by immense glaciers. It was here that De Saussure spent some time in 1789.

This point is situated at 3,350 metres (10,866 feet,) above the level of the sea. I visited the place with M.M. O. Sella and B. Gastaldi, on the 17th September, 1852, and gathered on the serpentine schists the following plants, the nomenclature of which has been kindly verified by M. Reuter.

PHANEROGAMIA OF THE HIGHEST POINT OF THE PASS OF SAINT THEODULE.

Ranunculus glacialis, L. Thlaspi rotundifolium, Gaud. ; Draba pyrenaica, L, ; D. tomentosa, Wahl. ; Geum reptans, L. ; Saxifraga planifolia, Lap. ; S. muscoides, Wulf. ; *S. oppositifolia*, L. ; Pyrethrum alpinum Wild. ; *Erigeron uniflorus*, L. ; Artemisia spicata, L. ; Androsace pennina, Gaud. ; Poa laxa, Haencke.

This list is far from being complete, still out of thirteen species there are three (in italics) which are found in Spitzbergen. I should be much pleased if any young botanist, Swiss or Italian, would undertake the task of completing the flora of this interesting locality. This may be the more easily accomplished now, since there has been for the last ten years a small Hotel

in which M. Dollfuss-Ausset, stayed in 1864, from 22nd August to 3rd September, the highest temperature noted by him during this period being 6°2 (43° Fahr.) and the lowest —16° (3° Fahr). We thus see that the climate is as rigorous as that of Spitzbergen, and it is very probable that careful botanising in the months of July, August, and September, would furnish a notable proportion of species indigenous to Spitzbergen and Northern Lapland.

CRYPTOGAMIA OF THE GRANDS MULETS.

In the *Naturalist*, vol. ii. p. 97, we gave a list of the flowering plants found at the Grands Mulets on Mont Blanc, extracted from a paper by Prof. Chas. Martins of Montpellier, entitled "Two Scientific Ascents of Mont Blanc." This list contained twenty-four species, and mentioned besides these twenty-six Mosses, two Hepaticæ, and thirty Lichens. By the kindness of Prof. Martins we are now enabled to complete the *florula* of this isolated tract, by the list of the Cryptogamia found there, furnished in a letter to the Editors, dated 3rd November, 1865.

Cryptogamia of the Grands Mulets, gathered by M. Venance Payot.

Mosses.

Weissia crispula, var. β atrata, *Schimp.*
Dicranum albicans, *Br.* and *Sch.*
Distichum capillaceum, *Br.* and *Sch.*
Barbula ruralis, *Hedw.*
Grimmia Doniana, *Linn.*
Grimmia ovata, *W.* and *M.*
G. alpestris, *Schleich.*
G. atrata, *Meil.*
Racomitrium heterostichum, *Brid.*
R. microscopum, *Hedw.*
R. lanuginosum, *Brid.*
Orthotrichum anomalum, ? *Hedw.*
O. rupestre, ? *Schl.*
Encalypta stenocarpa, *Hedw.*

Leptobryum pyriforme, *Schimp.*
Webera cucullata, *Schimp.*
Bryum pendulum, *Schimp.*
Bartramia pomiformis, *Hedw.*
Polytrichum piliferum, *Sch.*
Pteriginandrum filiforme, *Hedw.*
Brachystecium velutinum, *Schimp.*
B. collinum, *Br.* and *Sch.*
B. populeum, *Schimp.*
Hypnum cupressiforme, *Linn.*

Hepaticæ.

Gymnomitrium concinnatum, (*Steriles.*)
Jungermannia minuta, (*Steriles.*)

Lichenes.

Cetraria islandica, *Ach.* var. angustata.
Cetraria islandica, var. crispa, *Schær.*
Peltigera canina, *Ach.*
Solorina crocea *Ach.*
Umbilicaria alba, *Ach.*
U. anthracina, *Schær.*
U. polyphylla, *Hoffm.*
Parmelia ceratophylla, *β.* candefacta, *Schær.*
P. fahlunensis, var. stygia, *Schær.*
P. fahlunensis, var. tristis, *Schær.*
P. parietina, var. lichnea, *Schær.*
P. hypnorum, *Fries.*
Lecanora ventosa, *Ach.*
L. crassa, *Ach.*
L. polytropa, var. orbicularis, *Schær.*
Urceolaria cinerea, var. rufescens, *Schær.*
Lecidea atro-rufa, *Ach.*
Lecidea conglomerata, *Ach.*
L. geographica, var. contigua, *Schær.*
L. geographica, var. atro-virens, *Schær.*
L. geographica, var. alpicola, *Schær.*
L. viridis-altra, *Schær.*
L. armeniaca, *Schær*
L. superficiale, *Schær.*

L. morio, var. testudinea, *Schær.*
L. morio, var. coracina, *Schær.*
L. atrobrunea, *Schær.*
L. confluens, *Schær.*
Steriocaulon nanum, *Ach.*
Cladonia gracilis, var. subulata.
C. pyxidata,
Endocarpon pusillum, var. Hedwigii, *Schær.*.

Observations.

Loxia curvirostra, In vol. i. there appeared a notice of mine concerning a living specimen of the Cross-bill *L. curvirostra*, L., that I then possessed, and I there laid some stress on the fact, that among London Bird-salesmen, there existed an idea that this bird assumed a different colour after each moult. I have had the opportunity of bringing my own personal observation in witness to this strange feature in the character of this species. My Crossbill did not remain long with me, but shortly after my notice appeared in the *Naturalist*, I presented him to a lady at Cookham, who placed him in a large aviary, where he has since remained. When I first bought him, his plumage was bright orange, sparingly tinted with green shades. In October, 1864, he cast his feathers and his new coat was all green, very much resembling the female in appearance, with the exception of the head, which had a yellowish streak extending from the bottom of the eye to the shoulder, and from the middle of the back to the tail, a yellow ring took the place of the orange, which had been so predominant, when I first saw him. He has now just recovered from his late moult, and his plumage is now mostly green, with a bright yellow mark extending from the eye to the extremity of the occiput, while the yellow streak from the eye to the shoulders is now *black*, and his back is a beautiful yellow from the middle to the extremity of the tail-coverts. While on the subject of the Crossbill, I may mention an anecdote I have lately heard, which is supposed to account for the *cross bill*. It is said, that these birds, when our Saviour hung upon the cross, supplied him with water, which they brought in their beaks, and that for doing this, they were to be distinguished from all other birds by their bills, and the *cross* was to be to posterity a memorial of their pious service. This is evidently an old legend, the cross bill of the bird being peculiarly adapted for procuring food, which consists chiefly of the seeds from pine cones. The specimen at Cookham sings very nicely, the note being soft and flute-like, and he climbs round the wires of the aviary after the manner of Parrots. He seems of an agreable temperament, never interfering with the other denizens of the aviary, which consist of two goldfinches and several canaries.--R. B. SHARPE, 186, Strand, W.C.

The Quail.—Coturnix vulgaris.—On September 25th, we were out partridge shooting and fell in with a Quail which we followed up and after very little trouble it was shot by my father. On examination it proved to be a young bird in excellent plumage, although rather damaged by the shot; however I skinned and stuffed it carefully, and with a little trouble managed

to make a tolerable bird of it. I observed that the bird's crop was nearly full of barley. Quails are not at all common in this part of Hampshire, I never remember seeing more than two or three before, and none of them were killed, The Rev. Gilbert White, in the "Natural History of Selborne," (which village is about twelve miles from here,) says in Letter v., "there are few quails" found at Selbourne, but "after harvest, some few land rails are seen," this remark also applies to Moundsmere. – ANTHONY S. BRADBY, Moundsmere, Hants, October 28th, 1865.

Occurrence of a Pied Pheasant at Moundsmere.--A very nice pied variety of the common Pheasant was shot on Tuesday, October 17th, by Mr. A. D. Bradley, in a hedgerow near Preston Oak Hills. The following is as near a description of it as I can give :—Head and neck nearly white, body brown and white, nicely intermixed, wings same colour as body, lower part of back white, tail brown, with the exception of one feather which is quite white, legs and feet white, eyes of a very light colour. There are very few Pheasants about here. This bird was in beautiful condition being nearly free from any stains of blood, the feathers were pretty well up, but certainly some would have been better had the bird been further advanced in the moult.—ANTHONY S. BRADBY, Moundsmere, Micheldever, Hants, October 30th, 1865.

Occurrence of Chærocampa celerio at Waltham Abbey.—I beg leave to forward you an extract from the "*Waltham Abbey and Cheshunt Telegraph*," a local paper in Hertfordshire, of last week's date, which writes thus :—"One of the rarest of our British moths was captured a few days ago at Waltham Abbey. This beautiful moth *Chærocampa celerio*, very seldom appears in this county, and this only in isolated specimens, one only having ever been taken in this district before, and even that many years ago. The present specimen, which is in very fair condition, was taken by Mr. Chas. Pryor, and is now in Mr. Wakefield's collection, at Waltham Cross." This information may be interesting to many entomologists, and I would add that *Atropos* has, in chrysalis state, been abundantly taken around Cheshunt, and that I myself, as also others have had already fine specimens emerge from the chrysalis.—AUGUSTINE GAVILLER, Manor-Road, Stamford Hill, October 31st, 1865.

News.

Inula salicina, D. Cand. in Ireland.—Dr. David Moore of Glasnevin, has a paper in Jour. of Botany, No. xxxv. on his discovery of *Inula salicina*, on the margin of Lough Derg, in County Galway. He states that he first noticed the plant when searching for specimens of *Teucrium scordium*, in June 1843, and being then in a flowerless state he took it for a stunted form of *Hieracium prenanthoides*. The specimens he then gathered have remained in his herbarium as of doubtful name until the present year, when on looking over the herbarium, with Mr. G. More, for a little work upon which they are engaged, they were brought to light, and as Mr. More was coming to England, they were brought by him to be submitted to some botanical friends. When Mr. Syme saw the specimens he at once suggested they might prove to be *Inula salicina*, and in order to set the matter at rest, Dr. Moore paid another visit to the locality in August of the present year. He again found the plants, but only two of them were in flower, the rest having gone to seed. It grows on the side of the lake among rough herbage, consisting principally of *Schœnus nigricans*, *Molinia cærulea*, *Galium boreale*, *Solidago Virga-aurea*, &c., and was traced for more than two miles along the shore from Portumna onward until the ground became muddy and soft, when the herbage changed and the plant ceased to grow. In concluding his notice Dr. Moore says, "After comparing our plant with the

figure of *Inula salicina* in "Flora Danica" and also with cultivated specimens, I feel constrained to think it is at least not the normal form of that species. The midrib, under side of the leaf, and stem are rougher and more hairy in the Irish plant; besides the margins of its leaves are bluntly dentate. Koch remarks on *Inula salicina*:—'Variat rarius caule foliisque hirtis.'" "The discovery of this plant in the British Isles adds another link to the interesting chain of evidence, which has lately been much strengthened, and showing the existence, on the western shores of Ireland, of both South and Central European plants which do not reach Great Britain proper."

Gammon and Spinach.—Messrs. Trübner and Co. are, we understand, about to publish next month the first number of a *Comic* scientific newspaper, the objects of which are "to ridicule those scientific men with whom no serious argument can be held, to aim effective blows at the cliquism existing in some of our scientific societies, and to assist *savans* in laying aside conceit."

Vanessa Antiopa near Tenterden.—While shooting at Rolanden, near Tenterden, Kent, on the 7th September, I saw a fine specimen of *V. Antiopa* flying over a hop garden.—Robert Mitford, Haverstock Hill, N.W., 17th October, 1865.—*Entomologist's Monthly Magazine.*

Chœrocampa celerio at Southsea.—Yesterday I was greatly pleased at becoming possessed of a real live *celerio*, in fair, almost fine, condition. It was captured by Mrs. Collins, a lady residing at Southsea. It seems that her house adjoins some gardens, and has a grape vine growing on its back wall. A bed room window near which the vine is trained was open, and as the lady entered the room, she discovered the insect on the toilet cover, and deftly clapped a tumber over it. Knowing my taste for insects, she kindly sent it to me. I judge, from the extreme slenderness of the abdomen, and the appearance of the antennæ, that it must be a male. Noticing that Stainton says that this insect is often attracted by light, I have induced Mrs. Collins to set up a carriage lamp in the room, with the window open after dusk, hoping thereby to attract more should there be any in the neighbourhood.—Wm. Horn, Portsmouth, September 27th, 1865.—*Entomologist's Monthly Magazine.*

Capture of Chœrocampa celerio at flowers of Geranium and Physianthus.—I have pleasure in reporting the capture of a specimen of *Chœrocampa celerio*, fresh and in beautiful condition, on the 29th of last month, about twenty minutes past six o'clock, or just dusk. I took it with the net whilst hovering over the flowers of a bed of *Geranium* (Christine); this is the second specimen I have taken in the garden at Brantingham, ten miles from Hull. I took one in 1846, fast by the proboscis in a flower of *Physianthus albicans*, the flowers of which are excellent insect capturers; these flowers are very sweet and attractive, and the stamens are so placed, that the slighest touch by the proboscis of an insect entering the nectary, causes them and the anthers to close firmly round it. I have seen this plant with dozens of insects upon it, *Plusia gamma* in abundance.—R. C. Kingston, Brantingham Garden, near Brough, East York, October 4th, 1865.—*Entomologist's Monthly Magazine.*

Capture of Argynnis Lathonia at Dover.—On the 16th September, I captured in the garden of Mr. T. Clark, nurseryman here, a splendid *Argynnis Lathonia*. It settled on a bed of Zinnias, and I let the net fall perpendicularly over it, imagining it was either *Euphrosyne* or *Selene*, but the sight of the under-side of the wings at once removed all doubt, the largeness of the silver spots, and the row of seven brown rings with silver centres, giving the insect a truly queenly appearance. The specimen was very perfect, and did not seem to have suffered at all by its long flight, supposing it to have crossed the channel. The specimen, which is a female, has laid three eggs since I caught her.—John D. Richardson, Conservatory Cottage, Charlton, Dover, Kent.—*Entomologist's Monthly Magazine.*

TO OUR READERS.

PROPOSED UNION OF FIELD CLUBS.

At the recent Meeting of the British Association, at Birmingham, a proposal was made to establish a union of the various Field Clubs, which have of late years become so numerous throughout the country, for the purpose of more easy intercommunication of Observations, Notes, Notices, &c. This was proposed to be accomplished by means of a Periodical circulating amongst the Members, and to which they should promptly communicate all Observations, &c.; also Notices and details of the Excursions of such Clubs, Abstracts of Papers read, or Papers *in extenso*, if of sufficient interest, and any other matter of general interest to the Societies in union.

The *Naturalist*, a Journal already established for somewhat similar objects, has been proposed as a suitable medium for this purpose, and should this meet with the approval of Field Clubs generally, it will be so enlarged and modified as to become an efficient organ.

The benefits to be derived from such a means of intercommunication are too apparent to require pressing upon the notice of our readers.

The project has already the promise of the warm support of some of the most influential Members of Field Clubs in England, including the names of ,—

John Jones, Esq., F.G.S., Hon. Sec. of the Dudley and Midland Institute and Field Club.

The Rev. W. S. Symonds, F.G.S., President of the Malvern Field Club.

The Rev. P. B. Brodie, F.G.S., Vice-President of the Warwickshire Naturalists' Field Club.

Sir John Bowring; and A. H. A. Hamilton, Esq., President of the Exeter Field Club.

James Britten, Esq., President of the High Wycombe Natural History Society.

Jas. W. Hatton, Esq., Hon. Sec. of the Manchester Scientific Students' Association.

Should this proposal meet with the approbation of any Field Club which has not already been communicated with; the Editors of the *Naturalist*, will be glad to receive an intimation to that effect.

We shall also be glad of the opinion of any of our readers on the subject of the above circular which has been addressed to the Secretaries of Field Clubs.—[*Eds. Nat.*]

The next number of the *Naturalist* will contain the first part of an article by François Crépin, Prof. of Botany at Ghent, entitled "Description of Some Vegetable Monstrosities," which will be accompanied by a whole page plate in illustration of the subject.

Exchange.

Lepidoptera.—I have fine specimens of *D. templi*, and many others, and shall be glad to receive offers from any person in want of them.—C. Smethurst, 19, Wellington-lane, West-street, Leeds.

I have a good clean copy of Westwood's Classification of Insects, 2 vols. 8vo., for which I shall be glad to receive offers of exchange for any of the following :—

Wood's Ilustrations of the Linnean Genera of Insects.

Westwood and Humphrey's British Butterflies and their transformations.

Stainton's Manual of Butterflies and Moths.

Newman's Introduction to a History of Insects.

Harris's Exposition of English Insects.

The Naturalist, vol 1., and Episodes of Insect Life.

Supplement to Wood's Index Entomologicus, 1865.

Correspondents not receiving answers to letters in ten days may conclude their offers are not accepted.—F. Wilkinson, Stamp Office, Market Harborough.

MATERIALS FOR A FLORA OF WAKEFIELD AND ITS NEIGHBOURHOOD.

By T. W. Gissing.

(Continued from page 186.)

Order—LABIATÆ.

Lycopus. *Linn.* Gipsy-wort.

L. Europæus, L. Common Gipsy-wort. P. July—August. Kirkthorpe, Stanley, &c.

Salvia. *Linn.* Sage or Clary.

S. verbenaca, L. Wild Clary or Sage. P. May—August. Smeaton's Crag.

Mentha. *Linn.* Mint.

M. piperita, Sm. Peppermint. P. July—October. Heath, Parston.

M. aquatica, L. Water Mint. P. August—September. Common.

M. arvensis, *L.* Corn Mint. P. August—September. Common.

Thymus. *Linn.* Thyme.

T. serpyllum, L. Wild Thyme. P. June—August. Frequent.

Origanum. *Linn.* Marjoram.

O. vulgare, L. Common Marjoram. P. July—September. Pontefract, &c., on the limestone.

Teucrium. *Linn.* Germander.

T. scorodonia, L. Wood Germander, or Wood Sage. P. July—September. Common.

Ajuga. *Linn.* Bugle.

A. reptans, L. Common Bugle. P. May—July. Common.

Ballota. *Linn.* Horehound.

B. nigra, L. Black Horehound. P. June—September. Common. Frequently found with white flowers in this district.

Galeopsis. *Linn.* Hemp Nettle.

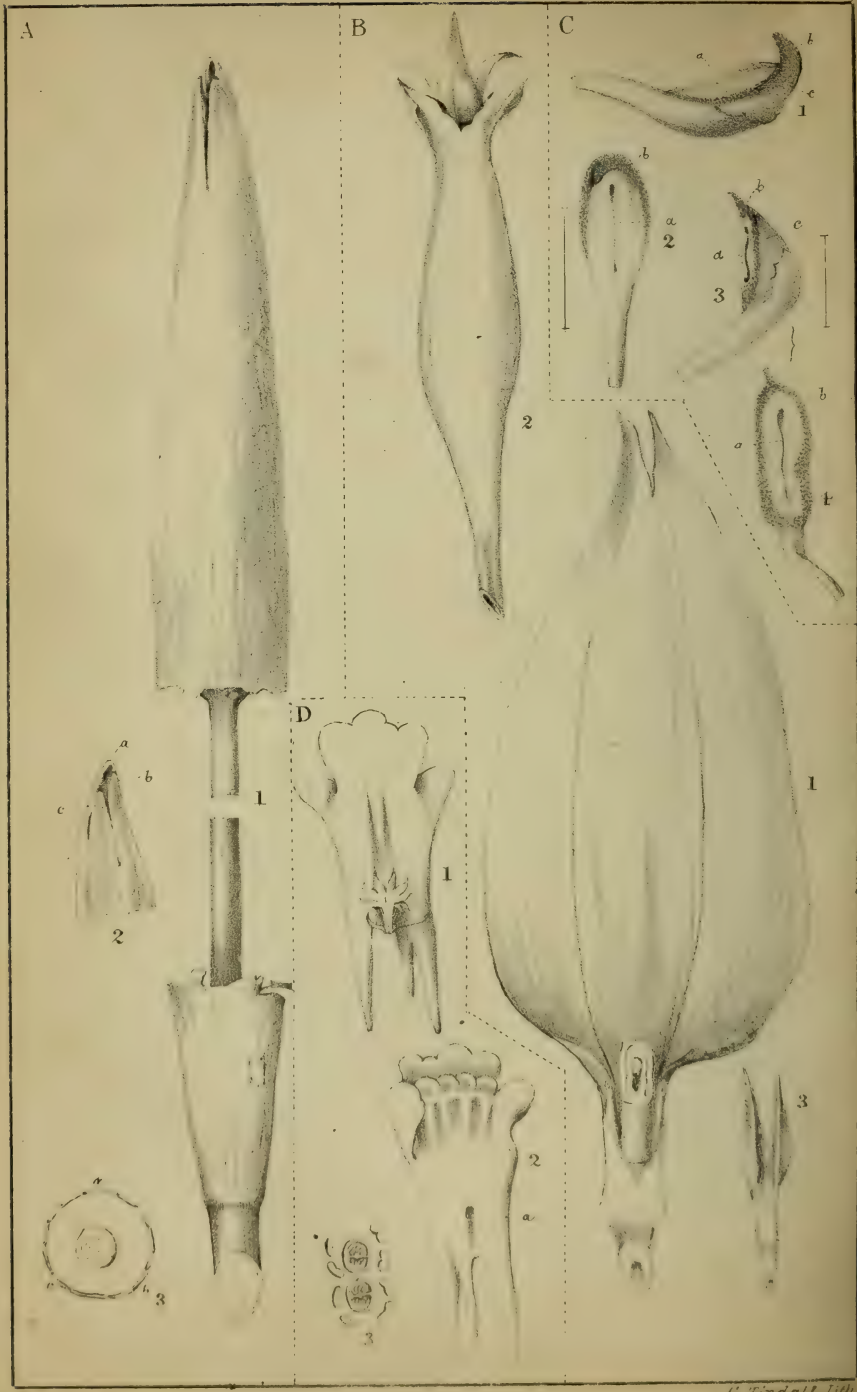
G. Ladanum, L. Red Hemp Nettle. A. July—September. Frequent.

G. Tetrahit, L. Common Hemp-Nettle. A. July—September. Common.

G. versicolor, Curt. Large-flowered Hemp-Nettle. A. July—September. Near Birkin, (Mrs. Roberts). Near the Calder below Heath.

Galeobdolon. *Huds.* Weasel-snout.

G. luteum, Huds. Yellow Weasel-snout, or Archangel. P. April—June.



Quet del. G. Tindall Lith.

LAMIUM. *Linn.* Dead Nettle.

L. album, L. White Dead Nettle. P. Often seen in flower in every month of the year.

L. purpureum, L. Red Dead-Nettle. A. Flowering in nearly every month.

BETONICA. *Linn.* Betony.

B. officinalis, L. Wood Betony. P. June—August. Frequent.

STACHYS. *Linn.* Wound-wort.

S. sylvatica, L. Hedge Wound-wort. P. July—September. Common.

S. palustris, L. Marsh Wound-wort. P. July—September. Common with white flowers near the Barnsley Canal at Agbrigg.

S. arvensis, L. Corn Wound-wort. A. May—October. Lofthouse, (Mr. Roberts). Warmfield. Frequent in gardens.

NEPETA. *Linn.* Ground Ivy.

N. Glechoma, Benth. Ground Ivy, Cat Mint. P. March—May. Common.

N. cataria, L. Cat Mint. P. July—September. Kippax, (Mr. Roberts.)

CALAMINTHA. *Mœnch.* Wild Basil.

C. clinopodium, Benth. Common Wild Basil. P. July—September. Common.

PRUNELLA. *Linn.* Self-Heal.

P. vulgaris, L. Common Self-Heal. P. July—August. Common.

SCUTELLARIA. *Linn.* Skull Cap.

S. galericulata, L. Common Skull Cap. P. July—August. By the Barnsley Canal and near Stanley, Lofthouse (Mr. Roberts.)

ORDER—VERBENACEÆ.

VERBENA. *Linn.* Vervain.

V. officinalis, L. Common Vervain. P. July—September. Knottingley and other places, generally not far from houses.

DESCRIPTION OF SOME VEGETABLE MONSTROSITIES.

BY FRANÇOIS CREPIN,
Professor of Botany.

I should have been able to enter at once upon my subject, and simply to describe those new facts which have come under my observation, but that I deem it necessary to reply first to some objections which have lately been

made on the subject of ordinary teratological facts. It has been said that to describe monstrosities which do not modify our current ideas, and theoretic principles does not in any way contribute to the advance of science. All those who are conversant with the wants of Teratology cannot admit any such way of thinking. And on what do the physical sciences and particularly the natural history sciences, in general, depend ? Most assuredly on facts ; and the more numerous these facts are, so much the more solid are the deductions, the more sure the theory. Nothing, it seems to me, ought to be neglected when we are engaged in the study of natural phenomena ; that which to-day appears insignificant, may to-morrow throw a new light on the subject and become of importance. When we are only engaged on simple statistics, we must still accumulate all unedited facts, whatever be their value. If we neglect ordinary cases, but which are nevertheless recognised in new plants and which are consequently new, how, in later times, shall those who, occupied on the generalisations of science, recognise what is rare from what is common and frequent ; how shall they deduce certain laws based solely on statistics ?

As far as regards ordinary and well known facts, and of which the interpretation is open to no doubt whatever, I consider it superfluous, to dilate at any length upon them, and their bearings. I have not thought it wise, after the example of some authors, to enter into lengthy erudite details, to cite the opinion of others on analogous facts, or to repeat what every well-instructed botanist ought to know well : to describe succinctly each monstrosity has seemed to me sufficient.

The greater proportion of the following cases appear to me altogether undescribed, but it is possible that one or other of them may have already been published. At present, it is extremely difficult to say, of any teratological fact whatever, that it is really inedited. To do this, would require that one should possess a very complete botanical library. The describer thus often runs the risk of repeating things already known. It is very desirable that some courageous worker would undertake the publication of a *General Index*, in which might be found an indication of all the described monstrosities, each accompanied by a short diagnosis.

In the following notes, where I employ the word *adhesion*, I do not use it in the sense of the old organographers, for it is well known that the greater part of the adhesions and cohesions are not adhesions properly so-called, but imperfections of disjunction, or, as M. Fermond expresses it, *defects of hecastosia.*

I. Tulipa Gesneriana, L. (*Pl. I. A. fig.*1. 2. 3.)

(*Adhesion and Deformation.*)

In a plant with simple flowers, the superior leaf, instead of being spread out, was transformed into a true spatha, which the development of the bud, and the elongation of the pedicel, had caused to break at its lower third. The pedicel measured nine centimetres (three and a half inches), and the flower was in the normal condition. Were there but the elements of a single leaf in this monstrous spatha ? In the transverse section (*fig* 3.) there are at the points *a. b. c.* slight thickenings which seem to indicate that it included the elements of three leaves. This supposition seems to be strengthened by the consideration of the three lobes into which the extremity of the spatha is cut. (*fig.* 2. *a. b. c.*)

I am indebted to the kindness of M. J. Samsoen, chief gardener at the establishment of M. Van Houtte, for this monstrosity.

II. Dianthus barbatus, L. (*Pl. I. B. fig.*1.2.3.)

(*Adhesion, Ascidium, * Multiplication.*)

On a stem of this Pink, commencing at the fourth internode, the two leaves of each pair were united by their borders simulating a single leaf bifid in a variable degree, the fission ranging from ten to forty-five millimetres (three-tenths to one inch and six-tenths) in depth. Fig. 1. represents the fifth pair of leaves. At the extremity of the same stem, the superior pair of leaves formed a bifid spatha, or if preferred a diphyllous ascidium (*fig.* 2.) which included the central floriferous axis and several lateral floriferous branchlets.

Cases of adhesion more or less complete were remarked on the branches of the stem in question. Thus *fig.* 3, represents a superior pair of floral leaves viewed from the back.

This kind of adherence of leaves was manifest on several stems of the same root, and also on other roots. On one of these stems I observed the two leaves of the same pair united only by their narrowest portion and for a length of about two centimetres (one and a half inches), and lastly another stem, somewhat slender, produced leaves verticillate in threes.

M. Eugene Coemans gathered this anomaly for me in his garden at Ghent, on the 20th May, 1865.

* (Greek *Askidion*, a small bag.)

III. Papaver maculatum, *var.* superbum. Hort. *(Pl. I. C. fig.* 1. 2. 3. 4.*)*

(Metamorphosis.)

The metamorphosis of stamens into pistils, of which the present is an instance, has already been described, if not for this species, at any rate for neighbouring types belonging to the same genus. Moquin-Tandon, in his classical work, states that this transformation has been observed by various botanists, in the bracteated poppy, *Papaver bracteatum*, *P. orientale*, *P. nudicaule*, and *P. somniferum*. M. Malbranche, * has noticed it in *P. hortense*, Huds. My reason for mentioning it is, that these authors describe a complete metamorphosis into pistils, whilst in the present case the metamorphosis is incomplete, the stamens have made one step towards, but have not become, veritable pistils. Firstly, the filament is considerably thickened and enlarged, and the same is the case with the upper portion of the stamen. The part *a* (*fig.* 1. 2. 3. 4.) simulates a placental surface charged with atrophied ovules; the part *b* presents a stigmatic aspect; lastly the part *c* assumes the colour and consistence of the intervals which separate the stigmatic rays of the disc of the capsule.

I have observed this incomplete ascending metamorphosis in a moderately large number of flowers. The transformed stamens, to the number of from twenty to fifty, are closely applied all round the normal capsule, which they either equal in height, or attain but to a third of it.

This monstrosity was produced in 1864, in the Horticultural establishment of M. Van Houtte, at Ghent.

IV. Linaria vulgaris, L. *(Pl. I. D. fig.* 1. 2. 3.*)*

(Synanthie.)

The elements of two complete flowers enter into the composition of this case. The figures 1. 2. 3. will render it unnecessary for me to enter into lengthy details upon it. The pedicel is enlarged and compressed, and presents a longitudinal furrow. Upon the hinder face of the tube of the corolla, is produced a somewhat deep depression *(a. fig.* 2.*)* which terminates superiorly, at the inside, in a narrowed petalloid tongue reaching to the level of the palate and which simulates a kind of style.

The pistil on the right hand side was a little feebler than the other. Figure 2. which is copied from a sketch, leaves something to be desired with

* (Quelques faits de tératologie végétale, par A. Malbranche, in 8vo avec une planche, p. 4. (Extrait du Précis de l'Académie Imperiale des Sciences, Belles-Lettres, et Arts de Rouen, Année, 1857-1858.)

regard to the lower lip. In a note made from a living specimen, I find the following :—"The flower is compressed, flattened, the upper lip prolonged and projecting in front, the palate has four lines of hairs and four protuberances, compressed, thickened, ragged, and covered by the four median lobes of the lower lip."

The above monstrosity was observed in the neighbourhood of Ghent in 1864.

I have seen several plants of *Linaria vulgaris* in which the tube of the corolla had thrown out narrow petalloid processes *(fig.* 1—3.*)* of from six to ten millimetres (one-fifth to four-fifths of an inch) in length.

V. Ornithogalum sulfureum, M. and K.

(Torsion.)

A floriferous stem of this liliaceous plant, gathered last year near Rochefort (Province de Namur) was affected by torsion for a length of fifteen centimetres (five and three-quarter inches). The torsion occupied the middle portion of the stem and was also slightly perceptible just beneath the fruit. At the two extremities of the twisted portion, the turns of the spire were open, but for the length of a decimetre (four inches) they were close-pressed.

NOTES ON NORFOLK ENTOMOLOGY.—*LEPIDOPTERA.*

By T. E. Gunn.

Part V.

At page 169 of the *Naturalist* appears a list of Norfolk *Diurni* and *Nocturni*, by the Rev. T. H. Marsh, that are recorded as not being mentioned in my previous notes on Norfolk Entomology. The list enumerates forty-eight species, twenty-nine of which, however, will be found included in my notes. (See the *Naturalist* Vol. I. pages 338 and 373 and Vol. II. page 126.) The Rev. T. H. Marsh mentions *T. quercus* and *L. Ægon* as common at Cawston, which I had mentioned as rare and uncommon ; my first notes as I then explained were chiefly confined to the outskirts of Norwich.

Diurni.

Argynnis Lathonia. A most splendid example of this rare species was captured by Mr. John Perry, at Plumstead, near Norwich, on the 2nd of

October last, he exhibited his fortunate capture the same evening, at the meeting of the Norwich Naturalists' Society, where I had the opportunity of seeing it. This is the second instance on record of the occurrence of this species in Norfolk during the present season; the former is mentioned in *Science Gossip* for October, by Mr. Glaspole, it having been captured by a young gentleman in the parish of Ormesby, St. Michael, near Yarmouth, during the previous month.

GEOMETRÆ.

Mr. W. Winter of Mulbarton, having kindly supplied me with a list of his Norfolk captures, I now offer the following additional species to my notes on the *Geometræ*. They were captured principally at Ranworth, Horning, &c:

Nyssia zonaria,
Cleora viduaria,
C. glabraria,
Tephrosia consortaria,
T. extersaria,
Psodos trepidaria,
Iodis vernaria,
Ephyra porata,
Acidalia strigilata,
Fidonia pinetaria,
F. conspicuata,
Larentia salicata,
Emmelesia albulata,
E. ericetata,
Eupithecia centaureata,
E. subumbrata,
E. Haworthiata,
Collix sparsata,
Lobophora lobulata,
Anticlea badiata, also taken by the Rev. T. H. Marsh at Cawston.
A. derivata,
Coremia munitata,
Phibalapteryx lapidata,
Scotosia vetulata,
S. rhamnata,
Cidaria psittacata,

C. silaceata, I also obtained an example this season; it having been attracted by the glare of the gas-light of our workshop.

Carsia imbutata.

Chesias spartiata, I also obtained one this season in the same manner as *C. silaceata.*

C. obliquaria.

DREPANULÆ.

Platypteryx falcula. Rare. Cawston, Rev. T. H. Marsh, Ranworth, &c., Mr. Winter.

P. lacertula. Ranworth, Mr. Winter.

Cilex spinula. Not uncommon. Cawston, Ranworth, &c.

PSEUDO-BOMBYCES.

Dicranura bicuspis. Rare. Mr. J. S. Sayer took one example at Horsford this season.

D. bifida. Ranworth, &c., Mr. Winter.

D. vinula. Not uncommon and generally distributed

Stauropus fagi. Rare. Cawston and Foulsham, Revs. T. H. Marsh, and F. O. Norris.

Petasia cassinea. Ranworth, Mr. W. Winter.

Pygæra bucephala. Common and distributed, generally abundant.

Clostera reclusa. Rare. Horning in 1858, Mr. Sayer; Ranworth, Mr. W. Winter.

Ptilophora plumigera. Ranworth, &c., Mr. W. Winter.

Ptilodontis palpina. Rare. Foulsham, Rev. T. H. Marsh; Ranworth, &c., Mr. W. Winter.

Notodonta camelina. Not uncommon and generally distributed.

N. dictæa. Rare. Foulsham and Cawston, Revs. T. H. Marsh and F. O. Norris. Ranworth, &c., Mr. W. Winter.

N. dictæoides. Rare. Heigham near Norwich, Mr. H. Hickling. Cawston, Rev. T. H. Marsh. I have bred it from larva in 1864.

N. dromedarius. Rare, Cawston, Revs. T. H. Marsh and F. O. Norris, Ranworth, &c., Mr. Winter.

N. ziczac. Common. Numerous at Neatishead in 1862.

N. trepida. Rare. Cawston, Rev. T. H. Marsh.

N. dodonea. Not uncommon.

Diloba cæruleocephala. Common and widely distributed; the larva and imago has been quite abundant this season.

Norwich, November, 1865.

Reports of Societies.

Norwich Naturalists' Society.

The usual fortnightly meeting of this society took place on Monday evening, the 30th of October, in the room, Surrey Mews, at eight p.m. Mr. J. S. Sayer, the president occupying the chair.

After the usual proceedings in opening the meeting, Mr. W. Winter, of Mulbarton, read a very interesting paper on Natural History and Societies. He commenced by giving an account of that delightful pursuit with instructions to the student how he should pursue his enquiries in the various branches of natural history; not merely with the intention of collecting and classifying objects in their natural orders, but by careful investigation, searching out all the minute details and circumstances, connected with the general history of each species. However laborious this task may appear to the young beginner at the first outset, he will, by prosecuting with ardour and zeal his enquiries, find the study of nature soon cease to be tedious, and the unravelling its mysteries, will be to him a source of great pleasure and gratification. The immense number of objects spread around everywhere is generally divided into three great departments, viz :—the *animal*, *vegetable* and *mineral*. The two former comprises the organic and animated and the latter the inorganic and inanimate portions of material nature. Natural history taken in its widest signification means the study of the whole creation; taken in its more restricted sense it is confined to Zoology and Botany; these are the two most natural of all sciences (if such a term may be applied), they deal with the material necessities of human life. To pursue the study of Natural History in general, we must enlist into our ranks, the Geologist, Botanist, Entomologist, Ornithologist, Microscopist, and others; each have their own peculiar working functions, but require the aid of each other in their varied pursuits. Geology may fairly claim the first and foremost rank, it treats of the earth and the various soils and materials it is composed of. Next comes Botany, including the names and classification of plants, and their uses to mankind. Closely following is Entomology, which teaches us the nature of the insect world in all its varied forms. The Ornithologist comes next, giving us the history of the feathered tribes, from the gorgeous bird of Paradise to that minute gem the humming bird. Mr. Winter also gave a brief description of Natural History Societies and how they should be conducted.

After a vote of thanks to the writer, the hon. secretary, Mr. T. Gunn read a paper on the varieties in the plumage of Norfolk birds, commencing by an account of several variations in plumage observed by himself in specimens found in Norfolk, and discussing the theories of various writers for the assumption of these abnormal hues; he also gave a short notice of the curious plumage of the Ruff, *Machetes pugnax*, during the summer season, scarcely two birds being ever observed alike in the colour and markings of the ruff or frill that surrounds the neck, which varies from a pure white to that of the deepest black, including colours in every variety, chesnut, ochre, ash, grey, and purple. He likewise noticed that when some birds arrive at maturity they change their plumage for that of the opposite sex, illustrated by an instance of the female of the common Pheasant, assuming the plumage of the male. He then proceeded to give a list of forty-one species of Norfolk birds, detailing the varieties of each, and their general colour of plumage. The paper was illustrated by a collection of upwards of forty specimens of variegated birds, including, black, buff, and white varieties of the skylark, chocolate, buff, and white varieties of the sparrow, cream, and pale-ash coloured varieties of the Sandmartin, Rooks, Partridges, Blackbirds, Fieldfares, and others.

The members after expressing their thanks in the usual manner, proceeded to view the collection of objects.

Mr. W. Winter exhibited his collection of insects consisting of several well filled cases of *Coleoptera* and *Lepidoptera*.

Mr. J. Percy exhibited a case of Butterflies, including the Queen of Spain Fritillary, *Argynnis Lathonia*, lately captured by himself.

Mr. W. Lumb exhibited a case of *Lepidoptera*.

Mr. T. E. Gunn exhibited three cases of *Lepidoptera*, comprising three divisions, the *Diurni*, *Nocturni*, and *Geometræ*; and also a case of *Coleoptera*.

The principal part of the above are Norfolk specimens collected or reared by the exhibitors.

Mr. Winter also exhibited a collection of British mosses, comprising nearly the whole of the species known to inhabit Britain.

After a vote of thanks to the various exhibitors the meeting adjourned.

There was a full attendance including a few visitors.—T. E. Gunn, Hon. Sec.

Norwich, Nov. 1865.

Oswestry and Welshpool Naturalists' Field Club.—First excursion, Haughmond Abbey, June 1st. The members met at the Shrewsbury Station at ten o'clock, when, after inspecting the various objects of interest brought from Wroxeter, they walked on to Haughmond Abbey. These beautiful ruins were carefully explored with the aid of the plan drawn up by the British Archæological Society upon the occasion of their visit to Shrewsbury, and kindly lent to the secretary by Dr. Henry Johnson. The Chapter-house, which is the part of the Abbey in best preservation, was especially admired. It presents in front three beautiful Norman arches, a feature of not unfrequent occurrence in the Chapter-houses of other early Abbeys. Haughmond Abbey was a monastery of the order of St. Augustine, and was founded in the year 1109, by William Fitz-Allen. Leland says that a chapel stood there before the abbey was built, and also that a hermitage stood within the site of the present abbey. Two old tombstones of the twelfth century are still preserved within, or close to the site of the ancient church, which has entirely perished. The inscriptions on these stones are in very singular Norman French, of which the following is a copy :—

"Isabel - de - Mor - r - sa - femme - acost - de - l - dew - de - lur - alme - merci - Amen."

"Wous - ki - passez - par - ici - pries - pur - lalme - John - Fis - Alein - kight - ici - dew - de-sa - alme - eit - merci - Amen.'

There is little to record geologically. The walk lay for the most part over the Permian strata. Haughmond Hill consists in its central portion of a mass of unstratified greenstone, very hard, and quarried where the Newport road gains the crest of the hill, for road metal, for which it is well adapted. The greenstone is well exposed in this quarry, and it may be traced along the summit of the hill to the abrupt termination of the latter on which the sham castle stands ; while on either side may be traced the dark purple Cambrian grit and conglomerate through which it has protruded along the whole length of the hill. These rocks are well exposed near the abbey. The party crossed the Severn by the Uffington ferry to Shrewsbury. After dinner, the president (R. G. Jebb, Esq., the Lyth, Ellesmere,) gave a very interesting description of a very ancient shield found on Bagley Moor, and supposed to be at least 2000 years old. Mr. J. Parrott (Llantysillio) showed some good specimens of Trilobites, from the neigbourhood of Llangollen. The secretary showed a very nice specimen of *Pecten* brought from Monte Mario (Crag), near Rome. The Rev. D. P. Lewis had promised to read a paper at this meeting but was unavoidably detained at home by parochial duties.

The second meeting for the season was held at Llynclys on the 13th of July, when the members spent the first hour in examining the shores of the Pool.

The party then visited the lowest beds of the mountain limestone as seen in Cooper's rock, Porthywaen, where several characteristic shells were found, as *Murchisonia Venualiana*, *Productus Llangollensis*, and *Cystinia carbonaria*. The lower Silurian shales, which in this neighbourhood underlie the Mountain Limestone, were next inspected where they are seen on the side of the road leading from Porthyvaen to Treflach, and in them were found some of their ordinary fossils. *Orthis* and *Leptœna* were again seen in the railway cutting in Nant Mawr. The alterations in Moreton's quarry were next noticed. The quarry, in its present state, shows a good view of the fault or dislocation in the strata which extends from the Moelydd to Lower Sweeney, and into the plain beyond. The party returned along the line of this fault to the old quarries in the uppermost beds of limestone at Wern, where many specimens of corals were obtained. From this point to Sweeney Tower the route lay nearly along the line of the junction between the Mountain Limestone and its overlying formation, the Millstone Grit. In "Sir Baldwin's" quarry Mr. D. C. Davies pointed out the fault in the strata to which Sweeney Hill owes its elevation. From thence they visited Mr. Savin's sandstone quarries where they were interested in observing the structure of the "Pockets" in the thick sandstone beds, and the layers of Feldspathic clay or Kaolin which lie between the sandstone beds. From the uppermost beds, which dip under the coal measures, numerous specimens of *Productus semircticulatus* and *P. Martini* were obtained; these were associated with stems of *Calamites*. The remains of Fucoids were very numerous, also an unique specimen of an Annelide or sea worm. The club next noticed the beds of fine grained compact sandstone adjoining the railway, which are well adapted for the finer purposes of architecture. The order and character of the various beds of grit as they are seen in the sides of Coed-y-go and Porthywaen railway were then rapidly noticed. The horizon of the various fossils that have been hitherto found was pointed out by the beforementioned gentleman, and the party halted to notice that the lowest beds of grit were like the uppermost fossiliferous.

The third and last meeting for the year was at Llangollen, on the 17th of August. Although a very stormy day the members assembled in fair numbers. Two routes were decided upon, one for the botanical, under the guidance of Mr. J. Parrott, of Llantysillio, the other for the geological section, under Mr. D. C. Davies. The former, which numbered most strongly on this occasion, got out at Berwin station, and visited first of all the beautiful ruins of Valle Crucis Abbey. After discussing the various features of the Abbey, the party set forth with the resolve to reach the "World's End." On their way thither, they passed a most picturesque and characteristic old house of the Elizabethan period, called Plas Eglwyseg, formerly a place of some distinction, but now only a farm house. After a good deal of stiffish climbing, they at length reached the "World's End," and well does the spot deserve its name, for a more secluded and desolate place can hardly be found than the head of this mountain glen. Here was found, but growing very sparingly, the Green Spleenwort, *Asplenium viride*. It was afterwards seen more abundantly in several other spots on the homeward route, also three kinds of club moss, *Lycopodium clavatum*, *L. alpinum*, *L. Selago*, Crowberry *Empetrum nigrum*, and where the rocks cropped out, plenty of the Brittle fern *Cystopteris fragilis*, and other commoner sorts. After descending to lower ground the botanists were rewarded by the discovery of another rarity, *Polypodium calcareum*, on the banks of a mountain stream. The geological section left Trevor station, and proceeded to examine the grit of the neighbourhood. The first quarry visited was that of the Messrs. Roberts, where they were able to trace the junction of this formation with the local measures. The lowest seam of coal in the North Wales coal field is ex-

posed in the entrance to this quarry, and under this a succession of massive beds of sandstone. From this quarry was obtained some of the usual fossils lately found in the Millstone grit. The party now walked up the slope of the hill to where the same beds are worked in another quarry, then traversed the whole series of underlying beds to their junction with those of the Mountain Limestone above the Trevor quarries, as seen by the club in the last excursion at Sweeney and Treflach. The uppermost beds of limestone on the summit of the Elyseg rocks were next visited, and numerous fossils obtained. A descent was then made down the precipitous escarpment of these rocks to the lowest beds, where *Productus Llangollensis* is found. The Wenlock shale was then rapidly traversed. After dinner a very admirable paper on Entomology was presented by Mr. J. Parrott. Appended is a list of some of the plants collected during the year. :— *Dianthus plumarius, Ornithopus perpusillus, Sedum Telephium, Lysimachia vulgaris, Rhamnus frangula, Paris quadrifolia, Œnanthe fistulosa, Scutellaria galericulata, Comarum palustre, Listera ovata, Angelica sylvestris, Trollius Europeus, Aquilegia vulgaris, Fumaria (Corydalis) claviculata, Gymnadenia conopsea, Orchis pyramidalis, Euphorbia exigua, Myriophyllum verticillatum, Euonymus Europœus, Rosa rubiginosa, Fontinalis antipyretica, Echium vulgare, Ceterach officinarum, Lastrea oreopteris, Botrychium lunaria, Asplenium viride, Polypodium calcareum.*

The Geologists' Association.

The Committee of the Geologists' Association have issued a circular to their members, announcing that at the next meeting, to be held on Tuesday, the 5th of December, a series of propositions received from Mr. Highley will be brought under their consideration, which are calculated to enlarge the sphere of the society's usefulness. The propositions are seven in number ; the first proposes that "it is desirable to obtain papers on subjects having a wider range of interest than those to which attention has hitherto been directed, especially in branches of Natural History, illustrating the types of ancient organic life."

"That for this purpose efforts must be directed for enlisting in its ranks students of all branches of Natural Science, especially men whose professional studies have led them to cultivate those pursuits."

"That lists of desiderata be prepared and extensively circulated, showing the Members of the Society, and those who may be willing to co-operate with them, what are the subjects upon which information is particularly sought, either by way of papers to be read or lectures to be delivered—either singly or in courses."

The remaining propositions refer to the organisation of the Field excursions, and of reporting to the Association the result of each excursion, and also that members be requested to report their own personal observations, &c.

Observations.

Occurrence of the Short Sun-fish in the Shetland Seas.—About the end of August, a fine specimen of the Short Sun-fish, *Orthagoriscus mola*, was caught in deep water off the island of Hoonie, and brought to me as a great curiosity. When first seen it was lying upon the surface flat on its side, and it not only allowed the boat to pull close up, but scarcely made any resistance to the four "huggie staves" or short gaffs by means of which it was brought on board, the dimensions were as follows —

	Feet.	Inches.
Length	3	4½
Breadth from tip of dorsal to tip of anal fin ...	4	10½
Do. exclusive of fins ...	2	1½
Greatest thickness ...	0	7
Length of pectoral fins ...	0	7
Length of dorsal and anal fins	1	4½

None of the fishermen had seen a fish of the kind before, but in Dr. Parnell's "Fishes of the Firth of Forth" this species is mentioned as having been observed several times on the west of Scotland.—HENRY L. SAXBY, Baltasound, Shetland, October 22nd, 1865.

Exchange.

I have the following good insects for exchange. Offers not replied to within a week may be considered as passed over—No insects will be sent until those exchanged for them be received :– *Blandiata, Alpinalis, Salicaria, Brunneatis, Flavescentella Cæsiata, Munitata, Trepidaria, Tincta, Davus, Cassiope, Athalia, Vitalbata, Ornata, Tiliæ, Plantagnis, Munda, Unguicula, Augur.*—W. OXENDEN HAMMOND, St. Alban's Court, near Wingham, Kent, November 15.

Lepidoptera.—I have amongst others duplicates of the following insects for which I shall be happy to receive offers of exchange :—*P. machaon, L. sinapis, P. cratægi, C. Edusa, A. Paphia, M. Artemis, T. rubi, T. quercus, L. ægon, L. Agestis, L. alsus, L. argiolus, S. alveolus, T. tages, S. populi, S. ligustri, M. stellatarum, P. statices, Z. trifolii, Z. lonicerœ, N. senex L. mesomella, L. complanula, L. complana L. griseola, E. russula, B. quercus, S. carpini, A. prunana, M. Margaritata,* C. *elinguaria, H. prunana, P. pilosaria, A. betularia, C. lichenaria, A. candidata, E. heparata, A. tenuiata, A. inornata, S. clathrata, P. petraria, F. piniaria, H. progemmaria, A œscularia, E. albulata, Y. impluviata, M. rubiginata, C. prunata, T. chærophyllata, C. spinula, N, dodonœa, D. cæruleocephala, T. derasa, T. batis, C. C. duplana, C. diluta, L. turca, L. lithargyria, L. pudorina, N. despecta, A. putris, X. hepatica, D. pinastri, L. testacea, M, anceps, A. basilinea,* A. *connexa, A. fibrosa, G. trilinea, C. alsines, R. tenebrosa, A. tritici, A. porphyrea, T. janthina, T. fimbria, N. augur, N. plecta. N. triangulum, N. brunnea, N. baja, T. instabilis, T. stabilis, O. suspecta, O. lota, O. macilenta, A. rufina, A. pratana, A. litura, A. vacinii, A. spadicea, S. satellita, X. silaga, X. ferruginea, C. trapezina, P. flavocincta, A. aprilina, A. herbida, A. nebulosa, A. advena, H. protea, H. dentina, H. oleracea, H. pisi, H. thalasina, C. exoleta, C. umbratica, A. myrtilli, H. arbuti, E. fuscula, H. unca, P. lota, A. pyramidea, M. maura, E. glyphica, P. œnea, H. barbalis, H. tarsipenalis, P. purpuralis, P. stratiotalis, H. nymphœalis, S. hybridalis, C. pinetellas. C. selasellus, M. sociella, H. prasinana.* Accepted offers will be responded to as early as possible, and marked lists carefully returned.—Rev. T. H. MARSH, Cawston Rectory, Norwich.

I have duplicates of the following insects for exchange :—*G. rhamni, V. Atalanta, V. cardui, S. semele, L. Corydon, A. atropos, C. dominula, M. maura, E. apiciaria, A. mutaria,* and *H. stagnalis,* also several pupæ of *S. tiliæ.* For these I should be glad to receive offers of the following :—Any of the Sphinges except *Ligustri and Stellatarum. C. villica, E. russula, C. plantaginis, B. rubi, S. carpini, A. ulmata, T. batis, T. fimbria, C. nupta, &c., &c.* In fact my wants are too numerous to mention.—Mrs. JAMES SEDFORD, South Newton, Salisbury, Wiltshire.

Original Articles.

DESCRIPTION OF SOME VEGETABLE MONSTROSITIES.

By François Crepin,
Professor of Botany.

(Continued from page 217.)

IV. Syringa vulgaris, L.

(*Fascia.*)

At the summit of a cylindrical stem of about seven millimetres (1-30 of an inch) in diameter, on which the buds affected an anomalous disposition, a fasciated axis grew out obliquely, about eighteen centimetres (seven-tenths of an inch) in length, about one thirtieth of an inch wide at its base, and twenty-two millimetres (three fifths of an inch) at its summit. Its thickness varied between four and five millimetres (1-50 to 1-25 of an inch), and the leaf buds were disposed around it in an irregular spire. Towards its upper portion and on one of its edges, two cylindrical branchlets were developed, from forty-seven to sixty-five millimetres (one fifth to one-fourth of an inch) in length. At its extremity were several flattened expansions of which three short ones (ten millimetres) and one longer (thirty-six millimetres) were inserted laterally and slightly reflexed. Between the three first and the last, projected an upright branch, more or less cylindrical, of which I could not measure the exact length, it having been broken at the end. On the terminal branchlets, the buds were for the most part atrophied.

On examining a transverse section, I found that the cylindrical branch and the fasciated axis were two years old, and that both belonged to the same generation. In the cylindrical branch, the medullary canal was already strongly developed on one of the sides, and in the fasciated portion it was narrow, elongated, and only covered on one of the flattened sides by a very fine layer of wood. This anomaly was reproduced in the year which followed the appearance of the first fasciated axis, on the summit of which might be observed several productions fasciated in their turn, and which presented but one single layer.

VII. Oxalis crenata, Jacq.

(*Fascia.*)

M. Samsoen has communicated to me a magnificent instance of *fascia*

in this plant, which was found in M. Van Houtte's garden. It measured forty centimetres (one and a half inches) in height, four centimetres (one-twenty-fifth of an inch) at the base and fifteen centimetres (three-fifths of an inch) at the summit. The blade, which was slightly distorted, bore marks corresponding to a great number of leaves disposed in an irregular spire. At its summit, a multitude of normal leaves were crowded together. On the sides at the base and for the space of ten centimetres (two-fifths of an inch) were seven slender, cylindrical, normal branches of from forty to fifty centimetres (one and three-fifths to two inches) in length.

If we compare a normal stem of *O. crenata*, of which the central axis bears at its base a number of branches rising at an acute angle, and attaining almost to the thickness of the latter, with the above mentioned fasciated axis, it naturally strikes the mind that in this case the greater part of the branches are fused in the principal axis, and that it is a case of "defect of disjunction," or in other terms a defect of *hecastosia*.

VIII. Campanula rotundifolia, L.

(Fascia, Doubling, Disjunction, &c.)

Three specimens of this plant, gathered by M. R. Beaujean, in the neighbourhood of Remagne, (Luxembourg), in July 1864, presented several anomalies.

First the principal axes were more or less fasciated (three to seven millimetres in width). As is always the case, the leaves are more numerous than usual and disposed in an irregular spire. In several places, the fasciated axes are disjoined, and produce (not in the axilla of the leaves) secondary floriferous axes, more or less elongated, and either cylindrical, or more or less fasciated in turn. On the secondary cylindrical branches, the flowers are sometimes normal, sessile, and geminate on the summit of the pedicels, and sometimes they present an unusual multiplication of elements, analogous to to what I am about to describe with regard to two very monstrous flowers terminating two of the primary axes. In one of these flowers, the enlarged pedicel (two millimetres) is surmounted by a broad calyx, with the limb formed of more than thirty narrow teeth. The corolla, much developed, also presents more than thirty lobes. The stamens in their turn are very numerous, and the pistil, altogether misformed and atrophied, is terminated by an enlarged style (four millimetres), a petaloid blade, divided at its upper edge into a great number of little teeth, resembling stigmata. The terminal flower of the second axis is not thus enlarged, and the different floral verticils,

although monstrous, have not so many parts as the flower I have just described. Lastly, the third axis, which is the most broadly fasciated, is strongly recurved ; it gives birth at its summit to a great number of filiform pedicels, of which the flowers, apparently normal, are very small and unopened. Its upper extremity is surrounded with floral elements more or less atrophied, very dense and numerous.

IX. Geum rivale, L.

(Median prolification.)

This *Geum* has already many times presented instances of median prolification, which have been described ; but as the present one may perhaps offer some new peculiarities, I would say a word regarding it.

The stem only bore a single terminal flower, the calyx of which was transformed into a large rosette, seven centimetres (three-tenths of an inch) in diameter, formed by six leaves or rather six bracts, reduced to their terminal lobe and furnished with stipules ; the petals, more lengthily unguiculate than usual were eleven in number; the androecium was reduced to twelve stamens. From the centre of the flower, deprived of its pistil, a thickened axis arose, four centimetres (one-eight of an inch) long, at the base of which were, first, two petiolate leaflets, one half of each being petalloid, then, three other leaves, oval-oblong, crenulate, completely herbaceous, and longly petiolate. Arranged round the proliferous axis, were three leaves reduced to their terminal lobe, and without stipules ; and on its summit was a verticil of seven similar leaves enclosing a kind of bud formed by a flower apparently incomplete and monstrous.

X. Crepis biennis, Moench, and Tragopogon pratense, L.

(Malformation.)

At the time of the excursion of the " Royal Society of Botany of Belgium" in Bas-Luxembourg last year, I encountered in a meadow near Virton, several roots of *Crepis biennis*, of which the heads of the flowers presented a strange aspect. They were very much enlarged at the summit, the involucre being greatly forced open to allow the flowers to push out. This anomalous enlargement was due to the hypertrophy of the pappus, the hairs of which were transformed into narrow elongate and greenish scales. On these plants, all the capitula were affected with this deformation, and the elements of the pappus were more numerous than in the normal flower. The ovary was more or less atrophied.

I have observed an almost identical teratological fact on a plant of *Tragopogon pratense*, gathered by M. Cogniaux at Ciply, (Hainaut). In one of the heads, the pappus was reduced to five scales, elongate and glabrous ; the corolla was deformed and the ovary more or less atrophied. In some specimens of the same species gathered by M. Devos, in the valley of the Meuse, the passage of the almost normal pappus into a more or less herbaceous and scaly pappus was observed, a transformation which he had questioned. The capitula enclosed ligulate florets sensibly longer than the leaves of the involucre.

These two cases have already been described and figured by M. Malbranche, in 1858, (loc. cit. p.p. 5--6.) But this author states that his *Crepis biennis* was poor and of small size, which is not the case with regard to the Belgian plant; and on the other hand his *Tragopogon* was infested by *Uredo candida*, which was not the case in the Ciply and Meuse valley plants.

FERNS AND THEIR ALLIES, COLLECTED IN THE VICINITY OF THE ENGLISH LAKES,—JULY—AUGUST, 1865.

By J. C. Melvill.—(Trin. Coll. Cambridge.)

FERNS.

Polypodium.

P. vulgare, L. Common Polypody. Very abundant. The var. *auritum*, with eared lobes at the base of each of the pinnæ occurs at Rydal.

The var. *denticulatum*, with acute pinnæ occurs sparingly.

P. bifidum, a well marked variety, with several of the pinnæ two-cleft is to be found on Petter Bridge, near Rydal, on the right hand side of the road from Rydal to Ambleside. Another form, more or less serrated, approaching to *P. serratum*, is found near Grasmere, on the road between that place and Rydal water.

P. Phegopteris, L. (Beech Fern). Very common. It is found in extraordinary luxuriance by Colwith waterfall, some specimens as large as a fine *L. Filix-mas*, while at high elevations, as Bowfell, Cumberland, it may be found very stunted, not more than three inches in height.

P. Dryopteris, L. (Oak Fern). This very delicate and beautiful fern, occurs at Scawdale Beck, near Ambleside, Rydal Park, Fairfield, and other places in Westmoreland, Keswick, abundant. Vale of Duddon, Lancashire, &c., &c.

P. calcareum, Sm. (Limestone Polypody). This, the *P. Robertianum* of Hoffman, occurs abundantly at Whitbarrow, Arnside Knot, and the limestone country about Kendal. It is a very local species.

ALLOSURUS.

A. crispus, Bernh. (Parsley Fern, Rock Brakes). Extremely abundant throughout the Lake district, growing often at extremely high elevations, such as Scawfell, where vegetation (with the exception of *Festuca vivipara*,) well-nigh ceases.

POLYSTICHUM.

P. Lonchitis, Roth. (Holly Fern, Alpine Shield Fern). This plant, though common in the Alpine parts of Scotland, is very rare here, indeed, almost extinct. It is said to grow on the Deepdale Crags, Fairfield, Westmoreland, in places almost inaccessible. Its extirpation is mostly owing to those pillagers of nature—tourists—who root up every plant they can find, whether they want to keep them or not. Last year two of this class carried a ladder over the Fairfield range, descended with it to Deepdale, and completely extirpated this rare fern. Surely such proceedings as these should not be tolerated, only it is hard to say what measures should be taken to put a stop to such depredations.

P. aculeatum, Roth., with both its vars. *P. lobatum*, and *P. lonchitioides*, occurs in Scardale Beck, Westmoreland, and a few other places, not so common in the north as in the south, apparently.

P. angulare, Newm. (Angular Shield Fern.) Loughrigg Fell, Westmoreland, in a wood on Nab Scar, Fairfield, &c.

LASTREA.

L. montana, Moore. This the *Oreopteris* or Sweet Mountain Fern, is very abundant all over the Lake district, and peculiarly luxuriant near that beautiful waterfall, Stanley Ghyll. I found the variety *L. truncata*, on Loughrigg Fell. There is a very good picture of this curious var. in Moore's Nature Printed Ferns.

L. Filix-mas, Presl. (Male Fern.) Abundant, as is also its var. *L. paleacea*, or Borrer's Male Fern. Multifid varieties are not unfrequent on Loughrigg Fell, Westmoreland. I found a variety similar to *L. Schole-*

fieldii of Moore. Five or six mountain varieties occur, such as *L. abbreviata*, but these are somewhat difficult of determination.

L. rigida, Presl. (Rigid Buckler Fern.) This rare fern is found on Whitbarrow, Amoide Knot, on limestone. I only found one batch of it on Whitbarrow.

L. spinulosa. (Var. of *L. cristata*, Presl.) (Spurious Buckler Fern.) Wood on the left hand of the pathway from Brathay Bridge to Skelwith and Colwith.

L. dilatata, Presl. (Spreading Buckler Fern.) The normal state is common in sheltered situations. The var. *nana* is found on most of the mountains. I met with the var. *dumetorum*, on Fairfield and Loughrigg Fell, Westmoreland ; and Bowfell, Cumberland.

The rare var. *L. collina*, (recognised as a species by Newman, as *Lophodium collinum*,) occurs sparingly on the Grasmere side of Loughrigg Fell, Westmoreland. The variety *L. tenera*, occurs on Bowfell, Cumberland. I found two other varieties but could not determine them. (*L. remota*, Moore, is said to have been found at Windermere, and *L. Thelypteris*, occurs near Keswick, but as I am only narrating what came under my own observation, I omit them here.)

ATHYRIUM.

A. Filix-fœmina, Roth. (Lady Fern.) This exquisite fern grows everywhere—by the dusty road-side—by the waterfalls—in woods—by the side of the lakes—and in a stunted state at high elevations. The principal varieties I met with were *A. molle*, in a wood under Nabscar, Rydal. *A. rhæticum*, Loughrigg Fell. *A. purpureum*, Eskdale, &c. *A. laciniatum*, Wood between Rydal and Grasmere. There are innumerable varieties besides these occurring in the district.

ASPLENIUM.

A. septentrionale, Hull. (Forked Spleenwort.) Borrowdale. I have seen plants from this locality gathered last August. It is said to grow on Red Screes, Kirkstone Pass.

A. germanicum, Weiss. (Alternate-leaved Spleenwort.) I obtained a plant of this from a garden at Ambleside, said to have been found wild at Borrowdale, but I cannot vouch for the truth of the statement.

A. Ruta-muraria, L. (Wall Rue.) Among loose limestone at Whitbarrow, at Windermere, &c. &c. Common.

A. viride, Huds. (Green Spleenwort.) On Whitbarrow Screes, Arnside Knot, &c., also at Easedale, and near Helvellyn, Cumberland.

A. Trichomanes, L. (Wall Spleenwort.) Everywhere abundant; covering every wall, and found in most of the crevices on the mountains. Several varieties are, I believe, to be found in the district.

A. Adiantum-nigrum. (Black Spleenwort.) This is more frequently found in the small obtuse state, (var. *obtusatum.*) But the normal state does occur, as well.

CETERACH.

C. officinarum, Willd. (Scaly Spleenwort.) Not very common at Whitbarrow, and the other limestone Screes.

SCOLOPENDRIUM.

S. vulgare, Sym. (Common Hart's Tongue.) This fern, is not quite so frequent here as might be expected. I myself saw it at Whitbarrow, (a multifid variety), and at Furness Abbey.

BLECHNUM.

B. spicant, Roth. (Common Hard Fern). Very common. A multifid variety was found at Rydal Park. The variety *anomalum*, in which the barren fronds become fertile, occurs all along the mountain stream that runs from Loughrigg Fell to Grasmere Lake. The rare variety *caudatum* I found on Fairfield, and the varieties *crispum* and *crassicaule*, on Bowfell, Cumberland.

PTERIS.

P. aquilina. L. (Brake.) Abundant. In a wood under Nab Scar, I found the variety *P. crispa.*

CYSTOPTERIS.

C. fragilis, Bernh. (Brittle Bladder Fern.) Not unfrequent; Helm Crag, Grasmere, Fairfield, very luxuriant. Whitbarrow, a crisp form, and variety *dentata*, Rosset Ghyll, Bowfell, Cumberland, &c. Of the variety *angustata*, I found one plant of on Loughrigg Fell.

WOODSIA.

W. ilvensis, R. Br. (Oblong Woodsia). Extremely rare. It is already stated in Moore's Nature Printed Ferns, that Mr. F. Clowes discovered it in three distinct stations in the Lake district; my friend Mr. J. Thornton after long search found one plant near Helvellyn, on August 25th.

HYMENOPHYLLUM.

H. Wilsoni, Hook. (Wilson's Filmy Fern.) Common. Rydall Head, Loughrigg Fell, Langdale, &c., Westmoreland. Rosset Ghyll, Bowfell, &c., Cumberland. *H. Tunbrigense*, Sm., occurs in the district. I did not however find it.

OSMUNDA.

O. regalis, L. (Osmund, Royal Flowering Fern.) Colwith, abundantly near to the Waterfall, and on the Grasmere road.

BOTRYCHIUM.

B. Lunaria, Sw. (Moonwort.) Troutbeck and Wansfell. (It had died down when I went to look for it in these localities.)

OPHIOGLOSSUM.

O. vulgatum, L. (Adder's Tongue.) I did not find this fern, for the same reasons that I did not find the Moon-wort; but I believe it is not unfrequent here.

FERN ALLIES.

LYCOPODIACEÆ.

ISOETES.

I. lacustris, L. (Quillwort.) In Stickle Tarn, Langdale Pikes, Rydal Water, Ulleswater, Windermere Lake, and no doubt in all the lakes.

LYCOPODIUM.

L. clavatum, L. (Stag's Horn Moss.) Abundant on all the mountains and heaths.

L. annotinum, L. (Interrupted Club Moss.) Bowfell, Cumberland, and even there sparingly. Rare in England.

L. alpinum, L. (Savin-leaved Club Moss.) Abundant on all the mountains.

L. selaginoides, L. (*L. selaginella*, Koch.) Fairfield valley. Common. Wastdale, Cumberland, Bowfell, &c.

L. Selago, L. (Fir Club Moss) Very common on all the mountains.

November 19th, 1865.

MATERIALS FOR A FLORA OF WAKEFIELD AND ITS NEIGHBOURHOOD.

By T. W. GISSING.

(Continued from page 213.)

ORDER—PRIMULACEÆ.

HOTTONIA. *Linn.* Water Violet.

H. palustris, L. Common Water Violet, or Feather-foil. P. May—June. Frequent.

PRIMULA. *Linn.* Primrose. Cowslip.

P. vulgaris, Huds. Primrose. P. April—July. Common. The variety *elatior*, (Oxlip) is occasionally found, as in Went Vale by Mrs. Watson.

P. veris, L. Cowslip. P. May—July. Common. The common name "Paigle" given in some parts to this plant seems altogether inapplicable.

LYSIMACHIA. *Linn.* Loose-strife.

L. vulgaris, L. Great Yellow Loose-strife. P. July—September. Birkin and Frystone (Mr. Roberts).

L. nummularia, L. Money-wort, or Herb Two-pence. P. June—August. Ackworth (Mrs. Watson,) Brotherton Marsh, (Mr. Roberts.)

L. nemorum, L. Yellow Pimpernel, or Wood Loose-strife. P. May—July. Frequent in woods.

ANAGALLIS. *Linn.* Pimpernel.

A. arvensis, L. Scarlet Pimpernel, or Poor Man's Weatherglass. A. May—October. Common.

A. tenella, L. Bog Pimpernel. P. July—September. In Miall and Carrington's Flora of the West Riding, this plant is said to grow between Ossett and Wakefield—no authority is given and I can hear of no one who has found it, although several have searched.

ORDER—PLANTAGINACEÆ.

PLANTAGO. *Linn.* Plantain.

P. major, L. Greater Plantain. P. June—August. Common.

P. media, L. Hoary Plantain. P. June—October. Frequent.

P. lanceolata, L. Ribwort Plantain. P. June—August. Common.

P. Coronopus, L. Buck's-horn Plantain. A. June—August. Heath, Woolley, Outwood.

LITTORELLA. *Linn.* Shoreweed.

L. lacustris, L. Plantain Shoreweed. P. June. Margin of Hiendly Reservoir.

SUB CLASS IV.—MONOCHLAMYDÆ.

ORDER—CHENOPODIACEÆ.

CHENOPODIUM. *Linn.* Goosefoot.

C. olidum, Curt. Stinking Goosefoot. A. August—September. Occasionally as the outcast of gardens.

C. album, L. White Goosefoot. A. July—September. Common. The variety *C. viride*, is sometimes found in gardens.

C. rubrum, L. Red Goosefoot. A. July—September. Alverthorpe.

C. Bonus-Henricus, L. Good King Henry. P. May—July. Stanley, Darton, &c.

ATRIPLEX. *Linn.* Orache.

A. patula, L. Spreading Halberd-leaved Orache. A. June—September. Common.

A. angustifolia, Sm. Narrow-leaved Orache. A. July—September. Common. Considered a variety of *A. patula.*

ORDER—POLYGONACEÆ.

POLYGONUM. *Linn.* Persicaria, &c.

P. Bistorta, L. Common Bistort, or Snakeweed. P. July—September. Newton, Stanley, Alverthorpe, &c.

P. aviculare, L. Common Knot Grass. A. May—September. Common.

P. arenarium, Wald. Sand Knot Grass. August. I found a single plant of this (very large and showy) by the river Calder near the bridge at Wakefield. Mr. Newbould identifies it as *P. arenarum*, which is found near Milcham in Surrey.

P. amphibium, L. Amphibious Persicaria. P, July—September. Frequent. The variety *P. terrestre*, is likewise frequent.

P. Persicaria. L. Spotted Persicaria. A. July—September. Common.

P. lapathifolium, L. Pale-flowered Persicaria. A. July—September. Frequent.

P. Hydropiper, L. Biting Persicaria. A. August—October. Frequent.

RUMEX. *Linn.* Dock and Sorrel.

R. Hydrolapathum, Huds. Great Water Dock. P. July—September. Askern (Miall and Carrington's Flora.)

R. crispus, L. Curled Dock. P. June—August. Frequent.

P. sanguineus, L. Bloody-veined Dock. P. July—August. The *green* leaved, which is considered a variety of the above is more frequent than the normal (?) form.

R. obtusifolius, L. Broad-leaved Dock. P. July—September. Frequent.

R. acetosa, L. Common Sorrel. P. May—August. Common.

R. acetosella, L. Sheep's Sorrel. P. May—August. Common.

ORDER—THYMELACEÆ.

DAPHNE. *Linn.* Spurge-Laurel.

D. Laureola, L. Common Spurge-Laurel. S. January—May. Levitt Hagg near Doncaster.

ORDER—EUPHORBIACEÆ.

MERCURIALIS. *Linn.* Mercury.

M. perennis, L. Perennial, or Dog's Mercury. P. January—May. Common.

EUPHORBIA. *Linn.* Spurge.

E. helioscopia, L. Sun Spurge. A. June—September. Common.

E. Peplis, L. Petty Spurge. A. July—December. Common.

E. exigua, L. Dwarf Spurge. A. July—November. Common.

BUXUS. *Linn.* Box.

B. sempervirens. L. Common Box. S. May—June. A cultivated shrub.

ORDER—CALLITRICHACEÆ.

CALLITRICHE. *Linn.* Water-starwort.

C. verna, L. Vernal Water-starwort. April—August. Common.

C. autumnalis, L. Autumnal Water-starwort. A. June—October. Sharlestone, Askern, in an aquarium—it will after a few weeks be almost impossible to distinguish one from the other.

ORDER—CERATOPHYLLACEÆ.

CERATOPHYLLUM. *Linn.* Hornwort.

C. demersum, L. Common Hornwort. P. July. New Miller Dam.

ORDER—URTICACEÆ.

URTICA. *Linn.* Nettle.

U. urens, L. Small Nettle. A. June—September. Frequent.

U. dioica, L. Great Nettle. June—September. Common.

PARIETARIA. *Linn.* Pellitory of the Wall.

P. officinalis, L. Common Pellitory. T. June—September. Parstone, Smeaton, Mirfield, &c.

HUMULUS. *Linn.* Hop.

H. Lupulus, L. Common Hop. P. July—September. Pontefract, Birkin, (Mr. Roberts), Mirfield, (Mr. Hobkirk). Hops are said to have been introduced into England from the Netherlands about 1524, when the citizens of London petitioned Parliament against their use, alleging that "it would spoyle the taste of drinke and endanger the people." In this same petition "Newcastle coals" were appealed against as another "nuisance,"—hops being the other.

(To be continued.)

OBSERVATIONS ON BIRDS.

By Anthony S. Bradby.

The season for the migration of our birds of passage having now well nigh drawn to a close, I offer a few of my observations to the readers of the *Naturalist*. These observations it will be seen were all made in Hampshire.

I observed this autumn that we were not visited by our usual flock of Pied Wagtails, *Motacilla Yarrellii*; we generally have lots of these birds about our buildings and ponds during the month of September, as I suppose just before migrating, they stay about here generally for some few days, or perhaps a fortnight, then disappear altogether: this season however, I have not observed more than half-a-dozen at the most *here*, but at Cliddesden, a village about four miles distant I saw a great number on October 6th; they were flying about a sheep-fold, and appeared very busy in picking up insects, &c. On October 13th, I saw a great many flocks of what appeared to me Pied Wagtails (at any rate they were Wagtails of some sort) flying over Preston Oak Hills, they flew in a S.E. direction.

I observed small flocks pass over at intervals all the afternoon.

The Whinchat, *Sylvia rubetra*, generally gives us a call as he passes, but this year I have not seen a single bird of this species at Moundsmere.

The Stonechat, *Sylvia rubicola*, is not by any means so common as it was last year, I have only seen a single pair in Preston Oak Hills, whereas I used to see as many as six or eight pairs.

The Ring Ouzel, *Turdus torquatus*, has not been seen about here this autumn, although we generally see some few pairs about Michaelmas week.

The Fieldfares, *Turdus pilaris*, have appeared in unusually large flocks this season, as yet I have only shot one, which was a young bird and in good condition.

Moundsmere, Micheldever, Hants, November 15th, 1865.

Reports of Societies.

Richmond and North Riding Naturalists' Field Club—The monthly meeting of this society was held on Tuesday, November 14th—the president, Mr. E. Wood, F.G.S., in the chair. The President exhibited a greenstone boulder, and stated that its probable history was one of much interest. Torn from its native rock, probably in Scandinavia, and borne during the glacial period embedded in an iceberg, it had been ground down and altered so that no sharp edge remained, and ultimately dropped on the millstone grit in the forest of Rossendale, in Lancashire, where it had laid and

been scratched by the glaciers passing over it, as it bears unmistakable proofs of the well known ice action of that very ancient period. The president next exhibited a piece of clay slate, from which he explained the great laws of the structure of our globe, and enlarged upon the deposits on its surface, and the wonderful "dip and strike" of its rocks. He also exhibited a set of lithographs of the minute *foraminifera*, of which our chalk rocks are composed, twenty-eight millions of their remains forming but one cubic inch of chalk, and yet they have been magnified to a large size, and the powers of the photographer brought to bear upon them when so enlarged; a large antler of the wild red deer, in a fossil state, found embedded in six feet of clay at Silton, and presented to him by Mr. R. M. Jaques; a "tibia" (leg bone) of the great extinct mammoth, from near Pocklington, in the East Riding; an oak shovel, found in one of the Swaledale lead workings, and presented to the president by Captain Harland. This caused an instructive discussion on the workings of the "old man" and lead veins. The primitive appearance of this implement proved the inadequate means at the time used for such purposes. Mr. J. Stoddart exhibited a fine example of the fossil *Productus giganteus*, from near Gilling, Mr. James Aspdin exhibited a rather rare specimen of the beetle tribe, *Astynomus ædilis* (male), captured by Mr. J. H. Brown, on board the s. s. British Queen, midway between Hartlepool and Hamburgh, on her return passage from the latter port, timber laden, last September. The larva had evidently fed on the timber which formed part of the cargo, or upon some part of the vessel itself, and had just emerged from the chrysalis when discovered by Mr. Brown. Mr. Aspdin read some interesting notes on the beetle by Mr. J. A. Harker of Perth, N.B. Mr. G. A. Bridges exhibited specimens of those well known chemical toys, called Pharaoh's serpents, and read an interesting paper on their composition and manufacture. Mr. J. Raine of Richmond, and Mr. Attre Johnson of London, were elected new members. After a vote of thanks to the Chairman, the meeting adjourned to the second Tuesday in December. —James Aspdin, Hon. Sec.

HIGH WYCOMBE NATURAL HISTORY SOCIETY.

The first evening meeting took place on Tuesday, November 28th, J. Parker, Esq., having kindly placed his house at the disposal of the society for that evening. The members partook of tea at six, after which the several collections sent for exhibition were inspected. Four cases of magnificent insects from China were sent by H. Gamble, Esq., one of the London members; they consisted of *Lepidoptera*, *Coleoptera*, *Heteroptera* and *Orthoptera*. These were much admired. The Wycombe species of *Ranunculaceæ* were sent by Miss Chandler, being a portion of the collection which gained the silver medal of the Horticultural Society in 1864; Wycombe moths sent by the secretary; British Ferns and Exquisetæ by the same; a pair of Albatross wings; a specimen of the Little Bittern, *Ardetta minuta*, a very rare British bird, shot by T. Marshall, Esq. by the Thames below Maidenhead.

After these had been well examined, the President, the Rev. T. H. Browne, F.G.S., read a paper on the Geology of High Wycombe, which will shortly appear in the *Naturalist*.

Mr. Ullyett supplemented this with a few remarks on the Boulders now being excavated on Naphill Common, their size, depth, and direction of deposition; he mentioned the fact that while all on the north side of the common are imbedded (some very deeply) in a red loam, and are composed of sandstone, there are about fifty above the surface in a field on the south side leading towards Bradenham Green, lying in a wide furrow having the appearance of being, so to speak, ploughed up by the agent of their translation, and curiously enough, none of these are sandstone, all are conglomerates of gravel pebbles.

A very animated discussion then ensued concerning glacial action, the probability or otherwise of glaciers and icebergs being concerned in the deposition of these foreign rocks upon chalk, and the present work of these agents was brought forward as an instance of the transportation of boulders now actually going on. The former condition of the globe, its alterations of climate, and the causes which led thereto, the ancient Mammalia of Britain, species of which have been found in abundance within a few miles of Wycombe, passed under consideration and afforded fruitful themes for discussion. The conversation afterwards turned upon astronomy, particularly meteoric stones and so-called thunderbolts ; and the evening's amusement concluded with the exhibition of foraminiferæ and fossil spicules or sponge flints from the chalk, mounted and lent by the President. The meeting then, having returned a vote of thanks to the President for his paper, and to J. Parker, Esq., for the use of his rooms, broke up, exceedingly gratified with the evening's work and hoping for another very shortly.—Hy. Ullyett, Hon. Sec.

Geological Society of Glasgow.

The first monthly meeting of this society, session 1865-66, was held in their hall, Andersonian University, on Thursday evening last, Edward A. Wünsch, Esq., one of the vice-presidents, in the chair.

The secretary exhibited and described a new chart of Fossil Crustacea, arranged and drawn by Messrs. J. W. Salter, F.G.S. and Henry Woodward, F.G.S., &c. This chart is a most interesting and valuable one. It contains upwards of four hundred and ninety figures beautifully engraved by Lowry, and not only shows at a glance, between transverse lines, the various genera of crustaceans belonging to each of the geological formations, but also, between curved vertical lines, the first appearance, gradual development and range in time, of each of the several orders, from the Cambrian period to the present, the top transverse section containing recent typical forms illustrative of the fossil groups figured below. He also exhibited and briefly described several fossils new to the Scottish carboniferous fauna, including one new to science. These fossils, from the upper coal measures, Kilmaurs, Ayrshire, he had selected from a large number collected during many years quiet unobtrusive researches in the field by one of nature's true sons, the late Thomas Brown, Stewarton. The fossils from Kilmaurs are chiefly found, finely preserved, in clay ironstone nodules, and are identical with those found in similar nodules about Coalbrokdale, in the Shropshire coal field. They consist of ferns and other plant remains, one of which of a graceful form, beautifully marked, is probably a fruit or cone, and though not new, is as yet undescribed. Another resembles an *Iulus*—a many-footed worm of the order *Myriapoda* ; it is new to science, and has puzzled many eminent palæontologists to whom it has been shown, and who appear to be at a loss as to its true relationship. There were also several specimens of the *Limulus rotundatus*, one of which showed a peculiar prolongation of the termination of the carapace, which Mr. Henry Woodward said he had never seen in the numerous specimens from the coal measures which had passed through his hands. The secretary referred to it as a link in a curious series of the modifications of an organ, as shown in some of the *Eurypteridæ* and *Limulidæ* in the chart. He then drew attention to a perfect and beautiful specimen of a *Bellinurus bellule* of the family *Limulidæ*, also from Kilmaurs, which he described and contrasted with a specimen of the recent *Limulus Moluccanus* from the Indian Ocean, the chief difference in their form being, that the series of thin abdominal overlapping plates of the former, are converted, in the latter, into a single triangular-shaped abdominal shield, with five pairs of swimming feet attached to it, and terminating, like

the other, with a long styliform telson or tail-spine. A fine specimen of this molucca or king crab, ten or twelve inches in diameter, may be seen in the collection of crustacea, lately arranged by Dr. Scouler in the Andersonian University Museum.

DISCOVERY OF FOSSIL TREES.

The Rev. H. W. Crosskey, having taken the chair,

Mr. Wünsch exhibited numerous specimens, diagrams, and sections illustrating his "discovery of fossil trees buried in volcanic ash in Arran," and read a paper on the subject, the joint production of himself and of Mr. John Young, of the Hunterian Museum.

Mr. John Young supplemented the paper with some more detailed remarks on the mineralogical character of the beds containing the fossils, and reiterated his conviction that the stems were the remains of true fossil forests, and undoubtedly found in position as they had grown.

Dr. Bryce, F.G.S., author of the "Geology of Arran," expressed his gratification at seeing a new field of geological research opened upon that island, and described as of the highest interest the fact of fossil stems of carboniferous wood being found enclosed in a matrix, which any uninitiated observer would undoubtedly pronounce to be true volcanic rock.

Observations.

Sucking Hedgehogs.—My kind friend Mrs. Smith of the Semaphore, near Wisley, Surrey, lately kept for me a female hedgehog, with three young ones. The little things had the soft fur on their bellies of a pure white colour, instead of brown, as in the adult animal. The fur on this part of the hedgehog is far softer than that of the cat, as it has to serve for a pillow when the creature is rolled up. To return to the little ones.—When in any way annoyed they "puffed" like kittens but with a more prolonged and continuous noise. Mrs. Smith kept them in a cellar out of doors, and one day I took two into the cottage to examine them without their mother; on my returning them to her in about twenty minutes, one little thing made several loud and shrill cries, evidently for joy at seeing her again. At length the mother escaped, but must have returned each night when all was quiet to suckle them, as the young ones lingered on for more than a week, but at length sunk and died. I may add that there were four in the litter, but one was killed by the person who caught them.—W. R. Tate, 4, Grove Place, Denmark Hill, London.

Notes made in the Autumn of 1865.—On the last day of November, I noticed several house martins, *H. urbica*, flying round some buildings and stacks in this parish. Bats have also made their appearance several times during the last few weeks. The Missel Thrush, *T. viscivorus*, is singing almost every morning, and on the 5th of this month I heard the Stock Dove, *C. œnas*, barking; on the 7th of October, I gathered a plate of Raspberries. This year I believe, has been considered a very favourable one for the entomologist, but, though I have not taken so many varieties as I did some few seasons ago, I still, among others, captured on the 13th of September, at sugar, in my garden, a fine specimen of *Catocala fraxini*, Clifden Nonpariel. Previous to this also at sugar, in the same locality, *X. scolopacina*, *C. cytherea*, *A. suffusa*, *T. munda*, *X. hepatica*, &c. &c. The humming bird Hawkmoth, *M. stellatarum*, has of course been extremely abundant, and as I have generally found it tolerably plentiful, so much space I hardly think, need have been taken up about it in the *Times* and other papers. With regard to Quails, of which mention is made in the last number but one of the *Naturalist*, they are seldom seen in this neighbourhood except singly, but this year they have been unusually plentiful, and I one day sprung a bevy of seven.—Richard Pye Alington, The Rectory, Swinhope, Lincolnshire. December 5th, 1865.

News.

A French Cure for the Cattle Plague.—The *Echo du Nord* states that a farmer has suggested a cure for the cattle disease to the veterinary college of that department. He proposes to inoculate healthy animals exposed to contagion with the saliva of a diseased beast. The operation is described as simple as vaccinating a child. It is done by making an incision of about half an inch deep in the inside of the hind quarter of the beast so as to form a sort of pocket, in which the saliva of the diseased animal is to be deposited. The animal thus treated will be attacked with the disease in a mild form, and, according to the farmer, will be for ever safe from any further attack.

Wild Animals in India.—We have before us a list of animals killed in these provinces during the first half of this year, with the amount paid for rewards. Total number of animals killed : Tigers, 359 ; leopards, 516 ; bears, 293 ; wolves, 99 ; hyœnas. 286 ; making in all 1,553, for which 23,561rs. 8a. have been expended. The number of animals killed is larger than the number killed during the preceding half-year, the rainy season of 1864, but it is somewhat less than the result attained in the corresponding half year of 1864. Mr. Campbell hopes this result may be due to an actual decrease in the number of wild animals.—*Central India Times*, October 28.

Notes and Queries.

Will you, or any of the readers of the *Naturalist*, kindly tell me what is the present name of *Conferva Echinulata*, E. B. 1378 and what is known about it ? In the English Flora it is called *Echinella articulata*. I had the pleasure of seeing *Saponaria vaccaria* and *Asperula arvensis*, growing together in some quantity this last summer they were in a field of tares near the well-known Darenth Wood, Kent.—WALTER H. REEVES, 20, South-street, Greenwich, December 8th, 1865.

Geometræ of the Norfolk Fens.—Mr. Gunn, on the authority of Mr. Winter, includes the following insects in his list of Norfolk Geometræ, (see p. 218, of *Naturalist* for December.) :—*P. lapidata*, *P. trepidaria*, *C. munitata*, *L. salicata*. Of *lapidata*, I believe the very few that have ever been taken have all come from Rannock, in Perthshire. *Trepidaria* is essentially a Scotch insect, and one affecting the highest altitudes—the larva probably lichenivorous—as the summits of the mountains and other localities where the insect is found, produce no other vegetation. *Munitata* and *Salicata* are both common to the mountainous districts of Great Britain—and their occurrence in the south, appears *most* improbable. *Salicata* especially belongs to the rocks—and I never saw *Munitata* low down. Is *Ericetata*, another of Mr. Gunn's insects, to be found in Norfolk. That again is an insect of the hills, but it possibly may be found on the heaths of the lowlands. Ranworth or Horning Fen might be hunted long enough without success for any of these five.—W. O. HAMMOND, St. Alban's Court, December 6th, 1865.

Exchange.

Lepidoptera.—I have fine specimens of *P. machaon*, *L. muscerda*, *L. stramineola*, *N. senex*, *A. leporina*, *L. pudorina*, *L. straminea*, *L. extrema*, *L. phragmitidis*, *N. fulva*, *N. despecta*, *S. mucronellus*, *obtusellus*, *H. cribralis*, and many other fen insects for exchange, also a great many mounted slides of named aphides and other objects for the microscope, which I should like to exchange for mosses or algæ to those in want of them. Address : DISCIPLUS, School House, Mulbarton, Norwich.

Original Articles.

NOTES ON THE EXTINCTION OF THE DINORNIS, OR MOA OF NEW ZEALAND.

By E. Foxton-Firby, F.A.S.L., F.R.A.S., &c.

That certain species of animals have gradually disappeared from the world of animated nature—become totally extinct, in fact—is an occurrence not unknown to naturalists. It is as characteristic of modern times as it was of the Pre-Adamite era. The causes of this gradual disappearance of certain species of animal may be sought for not merely in the advance of civilization, which has ever been inimical to the permanence of genera and species, but in the outward circumstances affecting the "*struggle for existence.*" Instances of this extinction might be adduced which have occurred not merely in modern but in recent times. The Great Auk, *Alca impennis*, is already on the verge of extinction, if not quite extinct. Although on the shores of Greenland, Spitzbergen, Iceland and Denmark the bones of this bird abound, it has been observed of late only on some rocky islets in the vicinity of Iceland; and one of these, which took its name, Geirfulga Sker, from the bird in question, was reduced to the level of the sea by the violence of volcanic agency in 1830, thus further curtailing the already too limited breeding-ground of the Auk. The Dodo was a living inhabitant of the island of Mauritius, in the latter half of the seventeenth century, and there is considerable reason to suspect that a specimen was exhibited in England about 1638. When, in the year 1598, the island of Mauritius was taken by the Dutch, who in honour of Prince Maurice gave it its present name, the bird in question was so abundant that the sailors gourmandized on the flesh to satiety, as it was easily killed, and the flesh, especially the breast, was considered a great delicacy. Le Strange, in his observations on Sir Thomas Brown's "Vulgar Errors," speaks of a Dodo exhibited (probably in an itinerant menagerie) in the streets of London about the year 1638. In Tradescant's catalogue ("Musuem Tradescantianum: or a collection of rarities preserved at South Lambeth," by John Tradescant, London, 1656.) We find, among the "whole birds, Dodao, from the island Mauritius; is not able to flie, being so big." The stuffed specimen of Tradescant subsequently passed into the possession of the Ashmolean Museum at Oxford, but, being un-

fortunately allowded to fall into decay, it was destroyed by the curators in 1755. The head and one of the feet, however, escaped the annihilating hands of the iconoclastic curators, and these, together with one other foot, safely stored in the British Museum, comprise the sole known remains of a creature commonly eaten within the last three hundred years. In the last century, a peculiar amphibious animal frequented the *embouchures* of the Lena, Yeneseï, Indigirki, and other great Siberian rivers, which is now to be sought for in vain. The Mongolian Argali, or Wild Sheep, *Ovis ammon*, inhabiting the mountain ranges of Siberia, Kamtschatka, and the higher regions of the snow-clad Himalayas, is rapidly becoming extinct. The Anoa, a ruminating animal of Summatra, of which only a few bones and cranial fragmenta have ever reached this country, is either totally extinct or on the eve of extinction. The Hook-billed Parrot of Philip's islands has completely vanished from the face of the earth. Some species, the remains of which have been found in the caves and alluvial mountains of central Europe, have merely changed their habitat, and have entirely withdrawn from the region they previously occupied. This phenomenon is not peculiarly striking, as it is repeated within historical times. The deer, the beaver, the ibex, formerly plentiful in Switzerland, have now entirely disappeared. The wolf is exterminated in England ; the bear is so in the greater part of Germany. On casting a glance at this departure of species, it seems singular, that most of such as formerly inhabited central Europe have retreated northward ; that consequently at the diluvial period there existed in the heart of Europe a fauna, the remains of which are at present only found in the north. These northern, but formerly central-European animals, include the glutton, the icebear, hamster marmot, the lemming, the reindeer, the elk, the aurochs, the musk ox, and the morse or walrus. Some of these species are apparently becoming extinct, as the bison, *Bison Europæus*, of which there exists only a single herd in a Polish forest. Others hover, as it were, on the boundary of the German continent, as, for instance, the elk, which inhabits only a small portion of the coast of the Baltic, but is found in Scandinavia, and some parts of Russia ; others have retreated to the Arctic circle, as the lemming, glutton, and reindeer ; others again, now inhabit the icy mountain regions, as the chamois, marmots, and ibex. Whilst among the extinct species types are found, which are at present confined to regions south of the Mediterranean, as lions, hyænas, and hippopotami ; we find among the departed species scarcely a well-founded instance of a retreat to the south ; and as regards the extinct species, as the elephant, and the rhinoceros, we may conclude that they

retired to the north, step by step, until they found the limits of their existence in the *tundra* of Northern Siberia. This view is supported by the fact, that the "collared lemming," *Lemmus torquatus*, at present existing in the highest north beyond the forest region, is now only found (fossil), in the ossiferous fissures of Northern Germany, but never further south.

The most remarkable case of extinction, within our own time, however, is that of the dinornis, or gigantic moa of New Zealand. The Dinornis, (Gr. *deinos*, wonderful; *ornis*, a bird,) belongs to a genus of large birds of the tribe *Brevipennes*; and many bones belonging to birds of this class have been found in New Zealand, not only in the most recent deposits, but in the sand by the sea-shore, in caves, in swamps, in the soil of forests and in the beds of rivers. Among the native Maoris there are many traditional reports about these birds, which were called *moa*. Other large birds, such as the *palapteryx* and the *aptornis*, are also spoken of by them. It is now about twenty-five years since a fragment of a bone, about a foot long, and very nearly as much in its smallest circumference, was forwarded to Professor Owen for examination. It had been found in New Zealand, where the natives ascribed it to a gigantic bird called moa, which they knew only by tradition, but which they believed might still exist in the more secluded districts of the country. The bone-fragment was part of the shaft of a femur; it was one-third as great in diameter as the femur of the largest kind of emu, and it had evidently belonged to a very large and powerful bird. Professor Owen came to the conclusion that it was a relic of a heavier and more sluggish animal, with shorter and thicker legs, than the emu or ostrich, and that it probably presented proportions more nearly resembling those of the dodo than of any existing *Struthionidæ*. Subsequent discoveries have confirmed, in the main, the correctness of these acute conjectures. Some of the remains since brought over to this country are now deposited in the British Museum, and the College of Surgeons possesses an almost perfectly restored skeleton. These remains prove that the moa, or dinornis, as Professor Owen has styled it, is a wingless bird, somewhat like the apteryx, but very much larger than it or any other living bird. There are eight or nine different varieties, ranging in height from four to ten and a half feet. "The extraordinary number of wingless birds," says Professor Owen, "and the vast stature of some of the species peculiar to New Zealand, and which have finally become extinct in that small tract of dry land, suggest it to be a remnant of a larger tract or continent over which this singular struthious fauna formerly ranged. One might almost be disposed to regard New Zealand as one end of the mighty

wave of the unstable and ever-shifting crust of the earth, of which the opposite end, after having been long submerged, has again risen with its accumulated deposits in North America, shewing us in the Connecticut sandstones of the Permian period the footprints of the gigantic birds which trod its surface before it sunk ; and to surmise that the intermediate body of the land-wave, along which the dinornis may have travelled to New Zealand, has progressively subsided, and now lies beneath the Pacific Ocean.

The bones of the moa are found alongside of human remains, seals, and birds of existing species ; they have cartilage, and other animal matter about them ; and some have been seen in a fossilized state. Professor Owen deems it probable that the race became extinct shortly after the arrival of the first Malayan immigrants. Being the only large animals in the country which could be used as food, it is very natural inferentially, to suppose that they were made an object of the chase before anthropophagy was resorted to. But how, it may be asked, should these great and powerful birds have perished, when the comparatively small and feeble apteryx has survived? In the struggle for existence (according to the Darwinian theory), upon which depends the permanence of the different genera and species, mere size and strength are of little importance. The dinornis, with its bulky form, would require a much more extensive feeding and breeding ground than the burrowing apteryx ; and hence the encroachments of man would operate more severely on the former. Its large size would also render it a conspicuous and tempting object to the hunter, while the smaller bird would secure safety by its comparative insignificance. The preservation of the apteryx is also due in no small degree to its nocturnal and excavating propensities, for, on the least sign of approaching danger, its natural *modus operandi* would be to seek concealment in its subterranean retreats. There can, however, be little doubt that at least isolated and solitary specimens of the moa were alive in New Zealand within a recent period, and in all probability subsequent to the foundation of the British colony. Hence, there has always prevailed a hope that a living specimen of the huge creature might still be found. Sixteen years ago, Mr. Walter Mantell explored every district, in the North Island, where the residuary bones of the moa had been found, and subjected the natives to a careful examination on the subject, but came back convinced that the moa was either extinct, or represented in the scale of existence by diminutive descendants, no larger than the apteryx. Although Mr Mantell failed in discovering the object of his search, he fell on the track of a contemporary of the moa, in one of his visits to the Middle Island. This bird,

which is now called *Notornis Mantelli*, is known to the natives as *moho*; it is believed to be also extinct, for no other specimen has ever been seen alive. It is a wingless bird, about the size of a fowl, with red beak and legs, dark purple body, the back tinged with green and gold, and a scanty caudal appendage. If the moa exists anywhere in New Zealand, we may confidently point to the secluded regions of the Middle Island, as the place of its last retreat. This island was never very densely populated, and thirty years ago it was well-nigh depopulated by a raid of a certain neighbouring tribe. Owing to its peculiar physical conformation, a precipitous mountain-range running north and south, the people were confined to the east coast. Their traditions point to the western side of the hills as the home of the moa; but as they also represent it as infested by the terrible *taniwa*, a gigantic lizard, which has a taste for human flesh, and as no lizard larger than eighteen inches has ever been found in New Zealand, no reliance can be placed on this, at best mythological source of information. On an examination of a *resumé* of the evidence for the utter extinction of the moa, we cannot but inevitably come to the conclusion that human eyes have seen the last of these gigantic birds of New Zealand, and that they have now completely passed away.

Victoria Terrace, Headingly.

ROUGH LEGGED BUZZARD.

By T. H. Gibb.

A magnificent female variety of this rare visitant was captured on the 21st October, at Holy Island, in a field near the castle, whilst it was being hotly pursued by an audacious crow, and a host of small birds. Its hapless advent on the Island may be traced to a "stress of wind and weather" for at the time an easterly gale swept down upon our rock-bound coast sufficiently strong to induce any biped particularly one of the species in question, which had perhaps journeyed from some morass in Norway or Sweden, to seek shelter and rest from its violence. With it also arrived and doubtlessly from the same cause, a large number of woodcocks. It is evidently a rare bird on the Island and I am not aware that it has been observed there for a great number of years.

In this bird the forehead, crown, and occiput are a very pale buff, and yellowish white, each feather streaked with greyish umber in the centre. The throat and chin white, more faintly marked with umber, the lore white, with the feathers compact and downy ; through which spring black radiating bristles. The bill, curved rather more than the fourth of a circle, is blue black, lighter at the base with its soft margins yellow; cere, gamboge yellow, irides of the same colour, the fore-neck and upper part of the breast very light cinnamon and cream, with longitudinal marks of dark umber on each feather. The sides and middle of the breast umber brown, the same colour a little more mottled and a shade lighter extending to the abdomen. Tibia and tarsi reddish ochre spotted with umber. Tarsi feathered their whole length, toes orange yellow, claws black, vent and under and upper tail coverts white, the latter streaked with three or four brown spots. The whole of the upper plumage greyish umber, each feather variegated on its outer edge, with cream and russet red, these light tints being most conspicuous on the scapulars; the middle and posterior part of the back more uniform in colour, the anterior part of the back and nape of the neck gradually running into the light colour of the head. The larger wing coverts and secondaries brown, primary quills white at their base, gradually blending into a grey, and from that to a brown, eventually becoming very dark at the tips ; outer edge of the wing white. The tail, which is composed of twelve feathers, is white for nearly two-thirds of its length from the base, the remainder clouded brown, with the terminal edge dirty white. Length twenty-one and a half inches, expanse of wings fifty-one inches, wing from flexure joint seventeen inches, tail nine inches, tarsus three inches, wings when folded a little shorter than tail, the third and fourth quills, which are nearly of equal length, the longest, the first four abruptly narrowed four and a half inches from their tips. Neck short but strong, skull large, rounded at base, flattened above, supra-ocular ridge prominent. Body full and robust anteriorly, somewhat compressed along the ribs ; œsophagus six inches long, swelling into an expansile sack, a little anterior to the proventriculus, stomach rather oblong than round, 1½ inches long, windpipe narrow, liver, heart and lungs moderately large ; weight thirty-one and a quarter ounces.

The rough legged buzzard has never been known to breed in Great Britain; it chooses for that purpose the northern parts of Europe and America, and is only an occasional visitor to our shores, Northumberland claiming its quota of visitors. Mr. Selby describes the habits of two individuals which

had stationed themselves in his vicinity. In the winter of 1863, a fine specimen was captured near to Fenham Slakes, where it had sojourned no doubt for the purpose of preying on the wild fowl which there abound.

As in *Buteo vulgaris*, though to a limited extent, individuals of *B. lagopus* differ from each other in their markings, these being more or less pale buff, or brown, and varying greatly in tint. In some examples the brown patch on the middle of the breast is of a uniform dark chocolate extending from either side, and right down to the abdomen and vent. In others it is mixed with russet brown, cream, and white, and altogether a less distinctive and diffused mark. Again, the tail has sometimes two bars on its dark portion, but in most instances is uniform and lighter at the terminal edge, and the basal half which is usually white, is not unfrequently blotched with pale brown.

Comparatively speaking the habits of the rough legged buzzard are but little known to those who have only observed the bird in Great Britain, and necessarily but few British writers have spoken at any length of its habits, from a close personal observation in this country. From Adubon and Wilson, however, who have had ample opportunities of observing the bird in America, where it abounds, and is permanently resident, we have fuller descriptions. Nearly all writers agree in designating him a sluggish, cowardly, inactive bird, prone to sit for hours together on a solitary perch waiting for some prey to come within his easy reach, rather than adopt the more dashing mode of capture of most of its congeners. This inactivity and lack of courage of *B. lagopus* viewed in conjunction and compared with his robust mechanism, and warlike appearance, is to me an anomaly in nature, and reminds one of certain other bipeds, mustachioed and booted, who, lacking moral courage, are not what they seem to be. Some writers advocate an injustice done to their hero, the buzzard. Mac Gillivray says of him. " that he is accused of being sluggish and inactive, because, when not hungry, they, like true savages, dose away their time, perched on a tree or a stone, and because they do not shew off by giving chase to pigeons, finches, or swallows, preferring more easily captured prey. The birds, in fact, are not fitted for such headlong flights as falcons, and are satisfied with a sufficiency of food, and when they have no curiosity to satisfy, nor any amusement to engage in, they naturally take their rest. Buzzards are generally in good condition, however, which proves that they are industrious ; though neither heroes nor sages, they live quite as comfortably, and enjoy life as much as if, like the goshawk, they were to keep the farm yard in perpetual terror, or like the eagle to soar beyond the

clouds, and as some persons assert, gaze on the unveiled splendour of the sun, or with " telescopic eye" look down on the creatures that crawl over the earth's surface." And he further remarks,—" The rough legged buzzard seems to me to have a more warlike appearance than his brother the common buzzard, and I have my suspicions that justice has not been done to him in respect to his courage and rapacity." All of this may be true enough, yet, it does not alter the nature of the bird in relation to others of a similar species nor does it add one iota in its favour. All will admit that the sloth enjoys life, and is as fat and comfortable as the great representatives of the feline order, but few will say they are as active, or embued with an equal courage. I fear me much that because he wears the "semblance of a brave," he is too often ranked as one.

In America the bird partakes of a more uniform brown tint, yet ever retains the distinctive marks on the lower surface of the wings. Wilson and others have described it as a distinct species, but Audubon has clearly disproved this, and it is now an indisputable fact that the American bird is identical with that found in Europe. It is widely and generally dispersed throughout North America, being found in the United States, the Canadas, and other British possessions, the fur countries and on the confines of Labrador. I have observed it in New Brunswick, Nova Scotia, New Jersey, and along the shores of Lakes Erie, Ontario, and St. Clair. It is more crepuscular in its habits than any other of the same family; its adaptability for which is little inferior to the owls. Sometimes, though rarely perhaps, it will remain on its perch, usually a dead or scattered branch of some conspicuous monarch of the forest and not stir abroad till twilight. In hawking, it adopts a short and slow flight, ever and anon alighting on some object a few feet from the ground, on which vantage ground it will rest till some luckless victim comes within his easy reach, which he will devour, then hie off to some other perch, repeating the same thing till he not unfrequently gorges himself to such a degree that it is an easy matter to secure him with the stroke of a stick. In the evening if he be not previously fed, he is wont to take longer peregrinations and may be seen skimming with slow and noiseless wing over the low grounds, skirting a wood, or above the level salt marsh, now and again pouncing, (not with the sudden sweep of the peregrine, nevertheless with a force usually effective, against young, or heavy and slow flying birds,) on a half grown wild duck, or some other aquatic fowl—or perchance he will seize a bull-frog by the head as he sits half immersed in water, sending forth his monotonous and discordant croak. Occasionally he

will mount in the air, reaching a high altitude by means of repeated spiral curves. At such times he greatly resembles the eagle in his soaring and bouyant flight. For what purpose this aerial voyage is undertaken considering the usual sluggishness of his nature,—and that it can have little or nothing to do with the capture of its prey, his invariable method of securing it, rendering such a procedure unnecessary,—I cannot determine; but it proves that he has the faculty and vigour to remain as long on the wing as the most robust falcon. In most instances when a capture is made, he carries the quarry to some slightly elevated position to devour it. In the autumn of 1853, I chanced to be with a friend in the woods bordering the river St. John's in New Brunswick, in search of *Tetra umbellus*, when, suddenly emerging into a clearing, over which was dotted the "everlasting black stumps," inseparable from such localities, we discovered a large bird sitting on one of them, which my companion deliberately approached and shot. It proved to be a very fine rough legged buzzard. The singular inactivity and slothful indifference exhibited by the bird proved to us the wide difference that exists between him and the more wary and active Ger-falcon.

Another incident which occurred to myself, shortly afterwards in New Jersey, U. S., is perhaps still more strikingly illustrative of his character. I had just fired off several shots at the edge of a pine wood and when in the act of reloading my gun I descried a rough legged buzzard sitting on an adjacent tree, which I shot without moving from the place where my last shot had been fired—but it is necessary to state that in this instance the bird was greatly gorged.

Although I have been in localities where they abound in considerable numbers, yet, I have never been able to discover their nest. Temminick however informs us that "it nestles on large trees, laying four eggs spotted reddish."

Alnwick, November, 1865.

Since writing the foregoing notes I have examined a second individual captured on the Kealder Moors, ranging along the south western portion of Northumberland. It is a male and altogether much darker and richer in colour than the one I have endeavoured already to describe. Its dimensions are 20½ inches long; expanse of wings, 50 inches; wing from flexure joint, 16½ inches; tail, 9 inches; weight, 28¼ ounces.

MATERIALS FOR A FLORA OF WAKEFIELD AND ITS NEIGHBOURHOOD.

By T. W. Gissing.

(Continued from page 235.)

Order—ULMACEÆ.

Ulmus. *Linn.* Elm.

U. campestris, L. Broad-leaved or Wych-elm. T. March—May. In hedges. Dr. Prior says the popular prefix "Wych" is a corruption of "*hutch*" from the wood of the elm having been used to make *hutches* (chests for provisions.) This term *hutch* is still in use in Suffolk—a chest used for holding flour being called a "flour-hutch." It is likewise applied to chests used for storing clothes, thus Bloomfield says :—

"And to the *hutch* she reached her hand,
And gave him out his Sunday breeches."

Order—AMENTIFERÆ.

Betula. *Linn.* Birch.

B. alba. L. Common Birch. T. May—June. In thickets and hedges.

Alnus. *Tourn.* Alder.

A. glutinosa, Gærtn. Common Alder. T. March—April. Common.

Carpinus. *Linn.* Hornbeam.

C. Betulus, L. Common Hornbeam. T. May. Woods and hedges.

Corylus. *Linn.* Hazel.

C. Avellana, L. Common Hazel. S. February—April. Common.

Fagus. *Linn.* Beech.

F. sylvatica, L. Common Beech. T. May. Frequent.

Quercus. *Linn.* Oak.

Q. Robur, L. Common British Oak. T. May—June. Common.

(Mr. Bentham's arrangement of the willow has been adopted.)

Salix. *Linn.* Willow, Osier, &c.

S. fragilis, L. Crack Willow, S. April—May. Frequent.

S. alba L. Common Willow. T. April—May. Frequent.

S. viminalis, L. Osier Willow, S. April—May. Frequent.

S. caprœa, L. Sallow Willow. S. March—May. Common.

S. repens, L. Creeping Willow. S. April—May. Heath.

POPULUS. *Linn.* Poplar.

P. alba, L. White Poplar. T. March—April. In hedges.

P. tremula, L. Trembling Poplar or Aspen. T. March—April. Frequent.

P. nigra, L. Black Poplar. T. April. Frequent

MONOCOTYLEDONOUS, OR ENDOGENOUS FLOWERING PLANTS.

SUB-CLASS I.—PETALOIDÆ.

ORDER—HYDROCHARIDACEÆ.

ANACHARIS. *Rich.* Anacharis.

A. alsinastrum, Bab. Long-flowered Anacharis. P. July—September. Common. This plant which was first discovered in Great Britain only in 1841—is now found almost everywhere. It can easily be understood how canals and running streams may have carried portions of the plant from place to place—but it has been found in small pools far above the level of these water-courses, and if not native the difficulty is to account for its appearance in these places.

ORDER—ORCHIDACEÆ.

EPIPACTIS. *Br.* Helleborine.

E. latifolia, Sw. Broad-leaved Helleborine. P. July—September. Carlton, (Mr. Roberts), Haw Park.

LISTERA. *Br.* Bird's Nest, or Twayblade.

L. ovata, Br. Common Twayblade. P. May—July. Woolley, New Miller Dam, Bullcliffe Wood, &c.

NEOTTIA. *Jacq.* Lady's Tresses.

N. spiralis, Rich. Fragrant Lady's Tresses. P. August—September. Went Vale, (Mrs. Watson.)

ORCHIS. *Linn.* Orchis.

O. Morio, L. Green Winged Meadow Orchis. P. June—July. Frequent.

O. mascula, L. Early Purple Orchis. P. April—June. Frequent.

O. ustulata, L. Dwarf dark winged Orchis. P. May—June. Went Vale, (Mrs. Watson.)

O. latifolia, L. Marsh Orchis. P. June—July. Frequent.

O. maculata, L. Spotted Palmate Orchis. P. June—July. Common.

O. pyramidalis, L. Pyramidal Orchis. P. June—August. Went Bridge. The variety with white flowers is sometimes found. The lobes of the lip vary much in shape and size. In *most* plants the lobes are equal but many have the outer ones much *larger* than the central. In some plants the cluster of flowers is so loose as to appear at first sight more like a thinly flowered *Gymnadenia conopsea.*

GYMNADENIA. *Br.* Gymnadenia.

G. conopsea, Br. Fragrant Gymnadenia. P. June—August. Went Vale.

HABENARIA. *Br.* Habenaria.

H. viridis, Br. Green Habenaria or Frog Orchis. P. June—August. Stanley, Lofthouse, Featherstone.

OPHRYS. *Linn.* Ophrys.

O. apifera. Huds. Bee Orchis. P. June—July. Went Vale, (Mrs. Watson.)

ORDER—IRIDACEÆ.

IRIS. *Linn.* Iris.

I. Pseud-acorus, L. Yellow Water Iris, or Corn flag. P. April—July. Common. The roasted seeds have been recommended as a substitute for Coffee.

The heraldic Fleur-de-lis is said to have been taken from this plant, but it would puzzle a botanist to point out the resemblance between the two. For the credit of the *flower* it is pleasant to know that it is still disputed whether the heraldic sign was taken from a flower, a *halbert-head*, or a *toad.* It was originally called Fleur de Louis—from its having been assumed as the device of Louis VII. of France, although previously used to some extent by other French kings and by the Emperors of Constantinople. From Fleur de Louis it has been changed to Fleur-de-Luce—Fleur-de-lys—and Fleur-de-lis. (Prior.)

ORDER—AMARYLLIDACEÆ.

GALANTHUS. *Linn.* Snowdrop.

G. nivalis, L. Common Snowdrop. P. February—March. Thorp, (Mr. Roberts.)

ORDER—DIOSCOREACEÆ.

TAMUS. *Linn.* Black Bryony.

T. communis, L. Common Black Bryony. P. May—July. Common.

Reports of Societies.

Richmond and North Riding Naturalists' Field Club.—Monthly meeting, December 12th. President Mr. E. Wood, F.G.S., in the chair. Many interesting specimens were exhibited on all of which explanations and discussions took place. The president exhibited a beautiful specimen of *Graptolites*, and a remarkable slab of Sandstone from the coal formation presented by Mr. Duff, of Etherly, on which are deep indentations, or footprints of some animal. He explained the nature of the deposit and stated that these right and left horse-shoe like markings had puzzled the geologists of the age, who, so far, could but guess at the character of the creature that had left such mysterious foot-prints behind it. Mr. S. Richardson exhibited some specimens of the Death's Head Moth, *Acherontia atropos*, on which he read a paper by Mr. J. Aspdin. Mr. W. Hawxwell exhibited a fine specimen of the Great Grey Shrike, *Lanius excubitor*, on which he also read a paper. The specimen was shot at Whitcliff, near Richmond, on the 8th of November last, and was presented to the museum of the club by Mr. W. Woughty. Mr. T. Ableson presented a powerful glass to the museum, for the examination of minute objects—Mr. L. Bradley, F.G.S., stated that he was ready to fill the drawers in one of the cabinets in the museum with a labelled collection of the minerals of the district. In answer to a question from one of the members present, "Are live toads ever found embedded in solid blocks of stone"—the president gave a long and interesting explanation, pro and con, of this oft discussed question, by stating his firm conviction that it is impossible, and said he would gladly pay £5 for a broken open stone, with the toad that had come out of it, provided the stone had been solid until the time of its discovery. The meeting terminated with an address from the president upon the amount of work done and information given and obtained during this the first year of the club's existence; trusting for a great increase of members and a hearty co-operation for the new year. After a vote of thanks to the chairman the meeting adjourned to the second Tuesday in January.—James Aspdin, Hon. Sec.

The Queckett Microscopical Club.

At the monthly meeting of the above society, held at their rooms, 32, Sackville-street, Piccadilly, on Friday evening, 22nd December. Mr. P. Le Neve Foster, vice-president in the chair.

Mr. Bockett read a very interesting and practical paper on "How to arrange and keep a cabinet," after which an animated discussion took place.

The suggestion made at a previous meeting, for the appointment of a Sub-Committee to investigate vegetable fibres was again adverted to, and a committee was appointed "to examine vegetable fibres, with a view to ascertaining permanent structural characters, whereby one fibre may be distinguished from another, and to report thereon."

Mr, Hislop exhibited and described a microscope which had been made to his drawings and which comprehended several novel features.

Twenty-three members were elected and eleven candidates were proposed.

At the conversazione which followed, Mr. Beck and Mr. Powell exhibited their respective modifications of an American suggestion for brilliantly illuminating opaque objects when under examination with high powers.

Observations.

Anas fusca.—On the 20th of Nov. a fine specimen of the Velvet Scoter, *Anas fusca*, in perfect plumage, was killed by Mr. Robert Croft, of Fleetwood, on the River Wyre, about two miles from the mouth of the river, and was forwarded in the flesh to

Mr. Henry Miller, of Accrington. Upon dissection, it proved to be a male bird, and on opening the gizzard we found it to contain five marine shells, *Littorina littorea*, besides some young crabs. We were surprised at finding in the windpipe four large reservoirs, about three-quarters of an inch apart and measuring one inch across, and quite as hard as a piece of shell; whilst the windpipe between these reservoirs was only a quarter of an inch thick. Also, on the same date, a pair of snow buntings, *Emberiza nivalis*, in excellent plumage, were shot, and sent by the same person.—On the 26th of November, being out with a friend, I had the pleasure of seeing within fifty yards of us, amongst a flock of rooks and jackdaws, a fine specimen of the hooded crow, *Corvus cornix*. We watched it for a short time, and it appeared to be quite friendly with the rest of the flock. This is the only instance in which I ever saw the above species in company. I should be glad if any reader of the *Naturalist* could inform me what is the use of these reservoirs in the windpipe of the duck, as I have never observed them before.—Sydney Smith, Church, near Accrington.

Notes on some of the Vespidæ.—Being desirous to add to my collection of ornithic nests, and obtain those of a few insects and the smaller mammals, and as the great heat of the past summer afforded extra facilities for so doing, I kept up a sharp look-out round S. Neots, in the part of Huntingdonshire where I resided. I succeeded in finding a very pretty specimen of the habitation of a wasp, which I believe to be *Vespa Brittanica*, but unfortunately could not secure the owners. It is about the size of a small apple, and of a substance like grey paper. I also met with a fine colony of hornets, *Vespa crabro*, situated in a thatch, in the deserted hole of a sparrow and numerously tenanted. The insects had fallen upon a crop of grapes in the vicinity, and worked with such zeal as to have damaged it to a considerable degree. Though I did not suppose hornets to be crepuscular in their habits, yet our men assured me these were on the grapes when they left the garden at night, and on their return to mow in the morning again, they were also to be found. At first I was a good deal at a loss to know how to deal with them, fire could not be the agent of destruction, obviously; after a time however, when some had been killed by the ordinary plan of placing one hand glass upon another,—and so many insects had entered the trap, that the floor had been covered in a few weeks, with an entomological collection of several inches deep, and great variety,—I inserted a wad of cotton, soaked in Benzine into the hole; this had a partial effect, but a portion of the smell escaped through the thatch, and the attempt was not completely successful. The difficulty was not lessened by the mode of approach being up a ladder, when the returning hornets might take the besieger in rear, without his knowledge, and inflict a vengeance of great severity. (Query, how many hornets' stings would kill a man? the popular idea is strong on the subject I know.) A frost proved my best friend, and on November 1, after two ignominious retreats, I managed to carry off the nest in a plate with the remaining insects alive, but torpid, and placed it in the hall for the night, when things appeared quiet enough. Next day, however, the sun put my new lodgers into the most unpleasant activity, their appearance was decidedly "a caution," there was no fear of any one appropriating my prize; the distance preserved by spectators was most respectful, and I had smart work to kill each individual with a pair of tongs, my chief consolation being a bottle of soda in case of mishap. All things have however an end, and so had these *Vespidæ* to my "great content," as old Pepys would say. The nest now placed in a glass case rewards my trouble, while the slain were picked up by a friend who extracted their stings as microscopic objects. The dimensions I find to be about nine inches square, but I have seen much larger.—George Dawson Rowley, M.A. 5, Peel Terrace, Brighton.

Notes and Queries.

Mould on Lepidoptera.—Of all the enemies with which Lepidopterists have to contend, I think mould is the greatest. It first makes its appearance on the antennæ of the butterfly or moth, coating them with a light feathery substance, and finally spreads over the whole body and wings, discolouring them and ending in their total destruction. How is it to be got rid of? Surely there is some effectual remedy for stopping this infection. If some old hand in the art of insect preserving would explain this mystery, he would confer a great boon to amateurs in this delightful art; as I am myself aware, from bitter experience, that numbers of insects are put aside from a collection as useless things because they have become mouldy. I keep my specimens in a cabinet well fumigated with benzine, and placed in a dry, airy room, free from anything pertaining to moisture or dampness, and can by these precautions succeed in keeping clear of grease and mites; but mould will find its way to my treasures in spite of every precaution, disfiguring their wings and rendering them unsightly objects. I have heard that spirits of wine, applied with a camel-hair brush to the infected insect, is a means of stopping mould, but should not like to try it unless confirmed by some one who can vouch for its efficacy.—F. Wilkinson, Stamp Office, Market Harborough.

Exchange.

Oolitic Fossils.—I have duplicates of the above which I can exchange for *Silurian* or *Carboniferous* fossils. Lists of fossils for disposal, or the fossils themselves must be forwarded to John Williams, Esq., 16, Redcross Street, London, E.C.

Original Articles.

NOTES ON NORFOLK ENTOMOLOGY—*LEPIDOPTERA.*

By T. E. Gunn.

Part VI.

Thyatira derasa. Uncommon and distributed around Norwich, Cawston, Ranworth, Neatishead, &c.

T. batis. Not uncommon. Sprowston, Neatishead, Foulsham, Cawston, Ketteringham, Ranworth, &c.

Cymatophora duplaris. Not uncommon. Foulsham, Ranworth, Neatishead.

C. diluta. Same localities as above.

C. or. Same localities as above.

C. ocularis. Rare. Foulsham and Cawston, Revs. T. H. Marsh and

C. flavicornis. Rare. Ranworth, &c., Mr. Winter.

Bryophila glandifera. Rare. Ranworth, &c., Mr. Winter.

B. perla. Common and distributed.

Acronycta tridens. Not uncommon.

A. psi. Common. Very abundant, resting on the elms, in Chapel Field, in 1862—63.

A. leporina. Rare. Horning in 1860, Mr. Sayer, Foulsham and Cawston, Revs. T. H. Marsh and F. O Norris, Ranworth, Mr. Winter.

A. aceris. Uncommon, distributed. I have taken it around Norwich.

A. megacephala. Uncommon. I have taken it around Norwich, 1862 and 1863.

A. strigosa. Rare. Cawston, Rev. T. H. Marsh.

A. alni. Rare. Foulsham and Cawston, Revs. T. H. Marsh and F. O. Norris.

A. ligustri. Not uncommon. Foulsham and Cawston.

A. rumicis. Not uncommon ; generally distributed.

A. auricoma. Rare. Ranworth, Mr. Winter,

Simyra venosa. Rare. Ranworth, &c. Mr. W. Winter.

Leucania conigera. Uncommon but distributed, Neatishead, Cawston, Ranworth, &c. I have taken it around Norwich.

L. Turca. Common. Cawston, Ranworth. &c.

L. lithargyria. Common,

L. obsoleta. Rare. Cawston, Rev. T. H. Marsh ; Ranworth, Mr. W. Winter.

L. littoralis. Rare. Ranworth, Mr. W. Winter.

L. pudorina. Not uncommon in some localities, Cawston, Ranworth, Horstead, Horning, &c. Taken sparingly around Norwich.

L. comma. Not uncommon and generally distributed.

L. straminea. Local. Ranworth, Mr. W. Winter.

L. impura. Very common.

L. pallens. Common.

L. phragmitidis Local. Ranworth, Horning, Mr. W. Winter.

Senta ulvæ. Rare. Cawston, Rev. T. H. Marsh ; Ranworth, Horning, Mr. Winter.

Nonagria despecta. Not uncommon. Cawston, Ranworth, Horning, &c.

N. fulva. Not uncommon. Foulsham, Ranworth, Horning, &c.

N. neurica. Ranworth, Mr. W. Winter.

N. cannæ. Ranworth, Mr. W. Winter.

N. typhæ. Ranworth, Mr. W. Winter.

N. lutosa. Neatishead, Mr. J. S. Sayer ; Ranworth, Mr. W. Winter. I have specimens obtained in the former locality.

Gortyna flavago. Ranworth, Mr. Winter.

Hydræcia nictitans. Local. Plentiful at Hoveton, from 1859 to 1862· Mr. J. S. Sayer.

H. petasitis. Rare. Mr. Sayer captured two examples on Costesey common in 1860—one of which I have in my collection.

H. micacea. Not uncommon, generally distributed.

Axylia putris. Common, widely distributed.

Xylophasia rurea. Common. Sometimes abundant.

X. lithoxylea. Common.

X. sublustris. Rare. Cawston, Rev. T. H. Marsh.

X. polyodon. Very common.

X. hepatica. Not uncommon.

X. scolopacina. Rare. Cawston, Rev. T. H. Marsh. Beeston near Norwich in 1858, Mr. Sayer. I have specimens taken in the latter locality.

Dipterygia pinastri. Plentiful around Norwich at sugar, Mr. J. S. Sayer.

Neuria saponariæ. Local. Plentiful at Neatishead at sugar, Mr. Sayer. It has also occurred at Horsford, Cawston, &c,

Heliophobus popularis. Not uncommon.

H. hispida. Rare. Ranworth, Mr. W. Winter.

Charæas graminis. Rare. Neatishead in 1860, Mr. Sayer, Cawston Rev. T. H. Marsh, Ranworth, Mr. Winter.

Cerigo cytherea. Uncommon. Cawston, Ranworth, &c.

Luperina testacea. Abundant around Cawston, Ranworth.

Mamestra anceps. Common.

M. furva. Pretty common near Cawston.

M. brassicæ. Very common everywhere.

M. persicariæ. Not uncommon and distributed.

Apamea basilinea. Very common, generally abundant.

A, connexa, Rare. Foulsham, Revs. T. H. Marsh and F. O. Norris, Ranworth, Mr. Winter. I have one in my collection taken at Neatishead.

A, gemina. Common.

A. unanimis. Ranworth, Mr. Winter.

A. ophiogramma. Ranworth, Mr. W. Winter.

A. fibrosa. Rare. Cawston, Rev. T. H. Marsh. Ranworth, Horning, &c. Mr. Winter.

A. oculea. Very common.

Miana strigilis. Very common.

M. fasciuncula. Not uncommon and distributed.

M. literosa. Uncommon and distributed.

M. furuncula. Ranworth, Mr. Winter. Rare at Cawston, Rev. T. H. Marsh.

M. arcuosa. Rare at Cawston, Rev. T. H. Marsh. Ranworth, Mr. Winter.

Celæna Haworthii. Rare. Ranworth, Mr. Winter.

Grammesia trilinea. Not uncommon. Cawston, Ranworth, Horning, &c.

Caradrina alsines. Not uncommon. Neatishead, Cawston, Ranworth, and around Norwich.

C. blanda. Ranworth, Mr. Winter.

C. cubicularis. Common. Abundant at Cawston, Neatishead, and around Norwich this season.

Rusina tenebrosa. Ranworth. Abundant at Cawston.

Agrotis valligera. Rare. Cawston, Rev. T .H. Marsh.

A. puta. Rare. Cawston, Ranworth, &c.

A. suffusa. Very common. Generally abundant.

A. fennica. Rare. Cawston, Rev. T. H. Marsh.

A. saucia. Rare. Ranworth, Mr. Winter.

A. segetum. Very common.

A. exclamationis. Very common.

A. corticea. Rare. Ranworth, Mr. Winter.

A. nigricans. Very common.

A. tritici. Common. Abundant this season around Norwich.

A. aquilina. Rare. Cawston, Ranworth, Horning, &c.

A. porphyrea. Pretty common at Horsford.

Tryphæna Janthina. Very common and distributed.

T. fimbria. Pretty common. Foulsham, Cawston, Ranworth, Horning, Neatishead, &c. Plentiful at the latter named locality at sugar.

T. interjecta. Very common and distributed.

T. orbona. Very common.

T. pronuba. Very common.

Noctua glareosa. Rare at Cawston, Rev. T. H. Marsh Neatishead,

Mr. Sayer. I have specimens from this latter locality.

N. augur. Common and distributed.

N. plecta. Common and distributed.

N. c-nigrum. Common and distributed.

N. triangulum. Not uncommon and generally distributed.

N. rhomboidea. Ranworth, Mr. Winter.

N. brunnea, Common at Cawston, Ranworth, Neatishead, &c.

N. festiva. Common and distributed.

N. dahlii. Rare. Ranworth, Mr. Winter.

N. subrosea. Ranworth and Horning Fens, Mr. Winter.

N. rubi. Ranworth and Horning, Mr. Winter.

N. umbrosa. Rare. Cawston, Ranworth, Horning. I have examples taken at Horsford.

N. baja. Abundant at Cawston, Ranworth, &c.

N. xanthographa. Common and distributed. Sometimes abundant.

Trachea piniperda. Common at Cawston, Ranworth and Horning ; abundant at Neatishead in 1863. Taken in March at sugar.

Tæniocampa gothica. Abundant at Cawston, Neatishead, Ranworth, &c.

T. leucographa. Rare. I took an example in 1864, while resting on the trunk of an elm in Chapel Field, Norwich.

T. rubricosa. Ranworth and Horning, Mr. Winter.

T. instabilis. Abundant. Cawston, Ranworth, &c.

T. opima. Rare. Ranworth fen, Mr. Winter.

T. populeti. Same as last.

T. stabilis. Abundant. Cawston and Ranworth.

T. gracilis. Ranworth, Mr. Winter.

T. miniosa. Rare. Ranworth, Mr. Winter.

T. munda. Ranworth, Mr. Winter.

T. cruda. Abundant. Cawston, Ranworth, Neatishead.

Orthosia suspecta. Rare at Cawston, Rev. T. H. Marsh. Ranworth, Mr. Winter.

O. upsilon. Rare at Cawston, Rev. T. H. Marsh. Ranworth, Mr. Winter. I have two in my collection taken at Neatishead.

O. lota. Common at Foulsham and Cawston, Rev. T. H. Marsh and Norris. Ranworth, Mr. Winter.

O. *macilenta.* Common. Cawston, Ranworth, &c.

Anchocelis rufina. Abundant. Cawston, Ranworth, &c.

A. pistacina. Common and distributed.

A. lunosa. Ranworth, Mr. Winter.

A. litura. Common. Cawston, Ranworth, and Neatishead.

Cerastis vaccinii. Abundant. Distributed.

C. spadicea. Common and distributed.

Scopelosoma satellitia. Common and distributed.

Hoporina croceago. Rare. Ranworth, Mr. Winter. Horstead, Mr. Sayer. I have one example taken in this latter locality.

Xanthia citrago. Rare. Foulsham. Rev. T. H. Marsh and F. O. Norris. Ranworth, Mr. Winter.

X. cerago. Rare. Foulsham and Cawston, Rev. T. H. Marsh and F. O. Norris. Ranworth, Mr. Winter.

X. silago. Not uncommon, and distributed.

X. gilvago. Ranworth, Mr. Winter. I have one, taken near Norwich.

X. ferruginea. Common.

Tethea subtusa. Rare at Cawston, Rev. T. H. Marsh. Ranworth, Mr. Winter.

T. retusa. Ranworth, Mr. Winter.

Euperia fulvugo. Rare. Ranworth fen, Mr. Winter.

Cosmia trapezina. Common, and distributed. Sometimes abundant.

C. diffinis. Rare. Ranworth, Mr. Winter. Neatishead, Mr. Sayer. Ketteringham, Mr. R. Gunn. I have taken both the *larva* and *imago* around Norwich. I have four varieties, one nearly black.

C. affinis. Uncommon. Ranworth, Neatishead, and Kettingham. I have taken it around Norwich.

Dianthœcia carpophaga. Rare at Cawston, Rev. T. H. Marsh. Ranworth, Mr. Winter.

D. capsincola. Common at Cawston and Ranworth.

D. cububali. Rare at Cawston, Rev. T. H. Marsh. Ranworth, Mr. Winter.

D. conspersa. Ranworth, Mr. Winter.

Hecatera dysodea. Rare at Cawston, Rev. T. H. Marsh. Ranworth. Mr. Winter.

H. serena. Common at Cawston, Ranworth, Horning, Aldeby near Beccles, &c.

Polia chi. Rare. Cawston, Ranworth, and Aldeby.

P. flavocincta. Common, and distributed.

Epunda viminalis. Rare. Cawston, Ranworth.

E. lichenea. Rare. Ranworth, Mr. Winter.

Miselia oxyacanthæ. Common, and distributed. Abundant in some localities.

Agriopis aprilina. Common and distributed. Abundant in some localities, such as Neatishead, Cawston, Ranworth, &c. I have a very pale yellow variety in my collection.

Phlogophora meticulosa. Common. Sometimes abundant. Widely distributed. Imago on wing during July and August.

Euplexia luciparia. Common, and distributed. In some localities abundant.

Aplecta herbida. Common. Neatishead, Cawston, Ranworth, Aldeby, around Norwich, &c.

A. occulta. Rare at Foulsham, Rev. T. H. Marsh, and F. O. Norris. Ranworth and Aldeby, Mr. Winter.

A. nebulosa. Common, and distributed.

A tincta. Rare. Ranworth, Mr. Winter.

A. advena. Pretty common at Foulsham, Cawston, and Wood Dalling, Rev. T. H. Marsh, and F. O. Norris. Ranworth, Aldeby, Horning, &c., Mr. Winter.

Hadena adusta. Ranworth, Mr. Winter.

H. protea. Common, and distributed.

H. dentina. Common, and distributed.

H. chenopodii. Rare. Ranworth, Mr. Winter.

H. atriplicis. Rare, Ranworth, Mr. Winter.

H. suasa. Rare. Ranworth, Mr. Winter.

H. oleracea. Common and distributed.

H. pisi. Common and distributed.

H. thalassina. Common and distributed.

Xylocampa lithoriza. Rare at Cawston, Rev. T. H. Marsh.

Cloantha solidaginis. Taken at Ranworth and Aldeby, Mr. Winter.

Calocampa vetusta. Rare at Cawston, Rev. T. H. Marsh. Ranworth, Aldeby, and Horning, Mr. Winter.

C. exoleta. Common, and usually distributed.

Xylina rhizolitha. Common. Cawston, Ranworth.

X. petrificata. Rare. Ranworth, Mr. Winter.

Cucullia verbasci. Common and local. Cawston, Ranworth, and around Norwich.

C. scrophulariæ. Rare at Cawston, Rev. T. H. Marsh.

C. lychnitis. Rare. Ranworth, Mr. Winter:

C. umbratica. Common, and usually distributed.

Heliothis marginata: Rare: Foulsham, Rev. T. H. Marsh, and F. O. Norris.

Anarta myrtilli. Local. Common at Cawston, Horsford, Neatishead. Ranworth, and Aldeby.

Heliodes arbuti. Common at Cawston, Rev. T. H. Marsh.

Acontia luctuosa. Rare. Ranworth, Mr. Winter.

Erastria fuscula. Uncommon. Foulsham and Cawston, Rev. T. H. Marsh, and F. O. Norris. Ranworth, Aldeby, Horning, Mr. Winter.

Hydrelia uncana. Rare. Cawston, Rev. T. H. Marsh. Ranworth and Aldeby, Mr. Winter.

Brephos parthenias. Rare. Neatishead, Mr. Sayer. Ranworth, Mr, Winter.

B. notha. Rare. Ranworth, Mr. Winter. I have one in my collection taken at Horsford.

Abrostola urticæ. Common and distributed.

A. triplasia. Rare at Cawston, Rev. T. H. Marsh. Ranworth, Mr. Winter. I have one in my collection, taken near Norwich.

Plusia chrysitis. Common, and distributed.

P. festucæ. Rare. Cawston, Rev. T. H. Marsh, Ketteringham, Mr. Geo. Cooke. Ranworth, Mr. Winter. I have taken it around Norwich.

P. iota. Not uncommon. Neatishead, Cawston, Ranworth, Horning, Aldeby, and around Norwich.

P. pulchrina. Rare at Cawston, Rev. T. H. Marsh.

P. gamma. Common everywhere. Sometimes abundant.

Gonoptera libatrix. Common, and distributed.

Amphipyra pyramidea. Not uncommon at Cawston and Ranworth. I received a single example from Ketteringham last season, and bred an example this season from the larva taken at Haddiscoe, larva feeding on willow.

A tragopogonis. Common, and distributed. Sometimes abundant.

Mania typica. Common everywhere. Sometimes abundant.

M. maura. Common everywhere. Sometimes abundant.

Toxocampa pastinum. Rare. Cawston, Rev. T. H. Marsh. I have one in my collection, taken at Neatishead by Mr. Sayer.

Catocala fraxini. Rare at Cawston. Taken at sugar, Rev. T. H. Marsh.

C. nupta. Rare at Cawston. Rev. T. H. Marsh. Not so uncommon at Ranworth and Neatishead, Messrs. Winter and Sayer. Taken pretty plentiful a few years since on the Heigham causeway, near Norwich, by Mr. Hickling.

C. promissa. Rare. Foulsham, Rev. T. H. Marsh, and F. O. Norris. Ranworth, Mr. Winter.

Euclidia mi. Taken plentifully at Neatishead and Ranworth by Messrs. Winter and Sayer.

E. glyphica. Common at Cawston, Ranworth, &c.

Phytometra œnea. Common. Cawston, Ranworth, Aldeby, &c.

Norwich, November, 1865.

ON THE BOTANY OF MALHAM.

By Louis C. Miall.

Part V.—Musci.

The following list of Mosses is mainly extracted from the "Flora of the West Riding."* All my lists up to the date of that publication were placed in Dr. Carrington's hands, and the few visits I have since paid to Craven have been specially devoted to other pursuits.

Synonyms are given where the nomenclature of "Wilson's Bryologia Britannica" differs from the text.

Sphagnum cuspisdatum, Ehr. Wet places on Malham Moor. Growing larger, and spreading widely when immersed. (Var. *plumosum.*)

Gymnostomum microstomum, R. Brown. Slopes near Malham Cove, Dr. Carrington. Doubtfully distinct from G. *squarrosum.*

G. rupestre, Schwaeg. Malham, Dr. Carrington. Rocks in Gordale!

Weissia verticillata, Schwaeg. Gordale!

Seligeria pusilla, Br. and Sch. Swallow-hole, above Malham Cove, and Gordale, J. Nowell. Dripping rocks in Gordale!

Dicranum pellucidum, Hedw. Gordale, Dr. Carrington. With the unimportant variety, *serratum.*

D. fuscescens, Turn. Under trees, Malham!

* Miall and Carrington's "Flora of the West Riding." London, 1862.

Campylopus densus. Shady banks, Malham, J. Nowell. Near a "laithe" below Malham Cove !

Leptotrichum flexicaule, C. Müller. *(Trichostomum,)* road from Settle to Malham, near the Cove !

Distichium capillaceum, Br. and Sch. Malham Moor, Dr. Carrington !

Trichostomum crispulum, Br. Gordale. Not in fruit.

T. mutabile, Br. Malham Cove, J. Nowell.

T. tophaceum, Brid. Gordale, Dr. Carrington.

T rigidulum, Sm. Walls between the Cove and Gordale ! Gordale, Dr. Carrington.

T. flexifolium, Sm. Malham Moor !

Tortula aloides, Br. and Sch. Road from Settle to Malham, opposite Rye-loaf, on millstone grit !

T. fallax, g. *brevifolia*, and d. *recurvifolia.* On limestone, Malham Moor, Dr. Carrington.

T. tortuosa, W. and M. Not uncommon on walls.

Syntrichia lævipila, Br. and Sch. *(Tortula.)* near Malham, Dr. Carrington.

Cinclidotus fontinaloides, Beam. Stream from Malham Cove, edge of the Tarn, near the rocks, eastward !

Encalypta vulgaris, Hed. Walls about the village ! *(Var. β. lævigata.)* J. Nowell.

E. ciliata, Hed. Rocks in Gordale. Malham Cove ! Dr. Carrington.

E. streptocarpa, Hed. Walls of bituminous limestone !

Orthotrichum neglectum, Schimp. Malham, on trees.

O. cupulatum, Hoff. Malham Moor, J. Nowell.

O. stramineum, Horn. Kirby Malham, Dr. Carrington.

O. tenellum, Br. Ash trees, near the Cove !

O. Lyellii, Hook. Fruit ; on trees near Gennett's Cave. J. Nowell.

Ulota crispa, Brid. Gordale !

U. phyllantha, Br. and Sch. Malham, J. Nowell.

Zygodon Mougeottii, Br. and Sch. Rocks in Gordale, and cleft above Malham Cove ! Barren state not uncommon.

Z. gracile, Wils. On walls near Malham Tarn, W. Wilson and J. Nowell.

Grimmia apocarpa, Hed. *(Schistidium.)* not uncommon on dry rocks.

Bryum crudum, Schreb. Gordale, Dr. Carrington.

B. pseudotriquetrum, Schwaeg. Malham Moor !

B. ceruum, Br. and Sch. Kirby Malham, J. Nowell. Walls near the bridge, Malham !

B. atro-purpureum, W. and M. Malham Cove! J. Nowell. Walls near the village!

B. Zierii, Dicks. Above the Cove, and Malham Moor! J. Nowell. Rocks above Gordale!

Mnium rostratum, Schwaeg. Gordale, on wet rocks!

M. orthorhynchum, Brid. Malham Moor, J. Nowell!

M. stellare, Hed. Malham Cove, J. Nowell. Walls near the bridge, Malham!

Cinclidium stygium, Wahl. Bogs near Malham Tarn! J. Nowell and W. Wilson. Wet places on the south of Kirkby Fell! I am not quite sure of the second station since comparing my specimen with Dr. Schimper's.

Amblyodon dealbatus, Beam. On slaty rocks, Gordale, Dr. Carrington. Near Malham Tarn, W. Wilson.

Aulacomnion palustre, Schwaeg. Malham Moor!

Funaria Mühlenberyii. Schwaeg. Rocks in Gordale, and the Cove, J. Nowell.

Philonotis calcarea, Br. and Sch. Malham Cove!

Bartramia ithyphylla, Brid. Malham Moor, J. Nowell.

B. Oederi, Sw. Malham Cove!

Splachnum sphæricum, Hed. Boggy places, Gordale! J. Nowell.

Pogonatum alpinum, L. Abundant on Malham Moor! Ewe Moor, &c.

Fontinalis antipyretica. L. Stream from the Cove!

F. squamosa, L. Stream in Gordale!

Anomodon viticulosus, Br. and Sch. Gordale, in fruit!

Antitrichia curtipendula, Brid. Gordale and valley below the Cove!

Cylindrothecium Montagnei, Br. and Sch. Rocks in Gordale, J. Nowell.

Orthothecium rufescens, Br. and Sch. *(Leskea,)* damp slaty (?) rocks in Gordale, J. Nowell. Between Kilnsey and Malham, about half a mile past the edge of the Moor, in fruit.

O. intricatum, Br. and Sch. Gordale! &c., frequent

Amblystegium Sprucei, Br. and Sch. *(Leskea,)* Gordale, J. Nowell.

Limnobium palustre, L. *(Hypnum,)* stream from the Cove, and Gordale!

Brachythecium nitens, Schreb. *(Hypnum,)* bog near the Tarn! J. Nowell.

B. lutescens, Huds. Not uncommon.

Hylocomnium brevirostre, Ehr. *(Hypnum,)* near the Cove, J. Nowell.

H. splendens, Hed. In fruit behind the Buck Inn, Malham!

Hypnum molluscum, Hed. Freqnent.

H. commutatum, Hed. With var. *fluctuans* in stream from the Cove !

H. revolvens, Sw. Bogs near the Tarn, J. Nowell. On millstone grit, near Rye-loaf !

H. falcatum, Brid. (?). Bogs on Malham Moor, J. Nowell.

H. rugosum, Ehr. Gordale and the Cove, J. Nowell.

H. stellatum, Schreb. In fruit near Malham Tarn, J. Nowell.

H. scorpioides, L. Bog near Malham Tarn, J. Nowell. I believe that "Beamsley rocks," cited as a station in the "Flora of the West Riding" with my name, is erroneous. The moss which I found there was *Limnobium (Hypnum) ochraceum.* A useful microscopical character of *H. scorpioides*, which is not, so far as I know, mentioned by any author is found in the teeth of the peristome. Between the large teeth two secondary *unicellular* teeth are exserted, both of which are much narrower than the primary ones, but nearly as long.

Eurhynchium crassinervum, Tayl. *(Hypnum,)* Malham, Dr. Carrington.

Rhyncostegium murale, Dicks. *(Hypnum,)* Gordale, J. Nowell.

R. depressum, Br. Rocks in Gordale, J. Nowell

R. tenellum, Dicks. Gordale, Kirby Fell, &c. !

Neckera crispa, Hed. Rocks and trees !

ON THE GEOLOGY OF HIGH WYCOMBE.

A Paper Read at a Meeting of the Wycombe Natural History Society' By the President.

Rev. T. H. Browne, F.G.S., F.M.S,, and F.E.S.

According to the classification of modern geologists, all the fossiliferous rocks that compose the known portion of the earth's surface, are arranged under four great divisions—the Primary, Secondary, Tertiary, and Quaternary. Each of these great divisions is supposed to refer to successive periods in the earth's history, during which certain animals and plants peculiar to their respective eras have existed, living when different kinds of sediments were deposited which now form the different strata. The Primary rocks are the most ancient formations. These include the Permian, Carboniferious, Devonian, and Silurian. Not one of this series of rocks is found in this neighbourhood. The Secondary rocks are well represented in this locality. This

great division of the geologist includes five important groups—the Cretaceous, Wealden, Oolite, Lias, and Trias. To the first of these series belong the chalk hills which form the principal feature of the country around Wycombe. If we take a short trip into the country, we find at Lane End a good representative of one of the Tertiary divisions. Near the surface, still more at a little depth below the surface, we find yellow and dark clays alternating with yellow and brown sands, with thin laminæ of white clay intermixed. If we compare the fossils of this place with those that are collected from the Reading and Woolwich beds, we shall perceive that they are generically and specifically the same. Hence we judge that this formation is of the same geological age, and must be ranked amongst the strata that compose the Tertiary division. In the road to Beaconsfield, on Flackwell Heath, and more largely developed at Cookham, we have gravel beds. These in the language of the geologist, are called drift. There are two series of gravels—the upper and lower level gravels. These beds consist of clays mixed up with flints more or less broken, which have accumulated in these localities by the action of floods, and perhaps been driven or carried along by large icebergs or glaciers. On some of the commons in our neighbourhood there are large Boulders. These are composed of granular siliceous sandstone. Their nature and origin were long a mystery, until the geologist threw some little light upon them. We have reason to believe that these great blocks of stone are mere wanderers which have been broken off from their parent rocks and have been carried along and deposited where we find them, by immense masses of ice called glaciers. The grinding and grooving actions of these icebergs on the rocks over which they have passed can still be seen by the experienced eye of the geologist. These Gravels and large boulder rocks belong to what is called by some geologists the Quarternary division, by others the Post-pleiocene division. These formations are closely connected with the recent history of our planet, aud perhaps may be identical with the period of man's history. In these gravels we discover the remains of large Mammalian bones. Amongst them are the bones of the Irish elk, rhinoceros, cave bear, but especially the elephant. Indeed the species of fossil elephants outnumber the species of recent elephants that now inhabit our world. The uppermost beds of the great Secondary division are called the Cetaceous group. But this group is subject to yet further subdivision iuto eight distinct formations, viz, the Maestricht beds and Faxoe Limestones, the Soft Chalk with flints, the Chalk Rock, the Lower or Hard Chalk, the Chalk Marl, the Upper Green Sand, the Gault, and the Lower Green Sand. The

first member of this series is not found in our own country. The next three formations in descending order may be examined in our own neighbourhood. They may be easily recognised at Keep Hill quarry. There is the soft chalk with flints. These are a distinguishing feature of this formation. Here may be collected *Terebratula carnea*, *T. semiglobata*, *Ananchytes ovatus*, and *Micraster cor-anguinum* with abundant specimens of a sponge, belonging to the gems *Ventriculites*. These are characteristic fossils. The soft chalk overlies the chalk rock, in which there is an abundance of fossils, but, on account of the exceeding hardness of the formation, it is difficult to extract these treasures uninjured. Below this formation lies the Hard or Lower Chalk. This formation is much more compact than the first; at places it approaches to the consistency of limestone. The other members of this group are not found in our immediate locality; but if we journey to Risborough, in the escarpment of the hill we shall find every member conformably resting on each other, with the exception of the lowest, viz., the Lower Green Sand. The Chalk formation is remarkable for its extent and its composition. The mass of chalk in Europe is immense; it ranges from the north of Ireland to the Crimea. Its length is nearly 1200 miles; its width, from the south of Sweden to the south of Bordeaux is more than 800 miles. In its deepest part, it is not less than a thousand feet in thickness. Whence originated this mighty mass? There is little doubt in the minds of scientific observers, that the whole of this large formation has been thrown down in ocean-waters. Probably a very large proportion of it is simple precipitate from water. This, of course, would be a mere granular mass like a mixture of chalk-dust and water. It has been suggested by some judicious observers and accomplished naturalists that a large proportion of this Chalk formation may have been the calcarious skeletons of Zoophytes, like the corals of our recent oceans. But a very large proportion of some of our chalk hills is an accumulation of microscopic organisms. We know from actual observation that minute but beautiful shells, accumulated by myriads of myriads beyond the power of human intellect to calculate, have actually built up the massive layers of the earth's surface. It has been said that we tread upon the ashes of the dead. It is true. But when we walk on yonder hills we tread on the habitations of the dead. Here are palaces of pearly beauty, all thrown together apparently in wild confusion. Ages after ages have rolled over those tenantless abodes, but they are not in ruins. The palaces of earth's mightiest monarchs have reared

their stately heads and fallen back into ruin and decay. These tiny homes of creatures long since dead preserve all the beauty and perfection of their pristine state. We have reason to believe that at the bottom of the ocean fresh strata are being built up by the remains of creatures which belong to the same order as those which compose the Chalk Hills around us. These Zoophytes are named Foraminifera, or chambered shells, on acconnt of the form and character of the shells. The inhabitant belongs to the lowest developement of animal life. Its body is very similar to soft gelatine. The name by which its substance is designated is sarcode. It is like a mass of granular matter without any tunic or outer covering to hold it together. When it is about to move, it has power to develope a slender thread-like filament, which can be absorbed again into the granular mass. When it feeds it simply envelopes its food with the substance of which it is composed, and receives it into the centre of the living jelly ; when all nourishment is extracted the mass opens again and execrates that which is not digested or absorbed. Has it sensation —has it volition ? We think not So far as our observation can discern, there is feeling without nerve, locomotion without limbs, action without muscle, eating without a mouth, digestion without a stomach, and it builds up its own home without exertion.

MATERIALS FOR A FLORA OF WAKEFIELD AND ITS NEIGHBOURHOOD.

By T. W. Gissing.

(Continued from page 252.)

Order—LILIACEÆ.

Agraphis. *Link.* Blue Bell.

A. nutans, Link. Wild Hyacinth, or Blue Bell. P. April—July. Common. The variety with *white flowers*, is occasionally found.

Allium. *Linn.* Garlic.

A. ursinum, L. Broad-leaved Garlic, or Ramsons. P. April—June. Frequent.

TULIPA. *Linn.* Tulip.

T. sylvestris, L. Wild Tulip. P. April. On the authority of the Rev. G. Pinder this plant is said to grow in a "Wood near Heath, Wakefield," but I have never seen it.

ORDER—MELANTHACEÆ.

COLCHICUM. *Linn.* Meadow Saffron.

C autumnale, L. Common Meadow Saffron. P. August—September. Garforth, Lake Lock.

ORDER—JUNCACEÆ.

JUNCUS. *Linn.* Rush.

J. effusus, L. Soft Rush. P. July—August. Common.

J. conglomeratus, L. Common Rush. P. July—September. Common. The above plants are united by Bentham under the name of *J. communis.*

J. glaucus, Ehrh. Hard Rush. P. July—September. Frequent.

J. articulatus, L. Jointed Rush. P. July—September. Common. This rush varies much in appearance ; I have adopted Mr. Bentham's revival of the Linnean name, uniting under it *J. lamprocarpus*, *J. uliginosus*, *J. nigritellus*, and *J. acutiflorus.*

J. compressus, Jacq. Round fruited Rush. P. June—August. Frequent.

J. bufonius, L. Toad Rush. A. August—October. Common.

J. squarrosus, L. Heath Rush. P. June—August. Woolley, Ryhill, Normanton, &c.

LUZULA. *D.C.* Wood Rush.

L. sylvatica, Bich. Great Hairy Wood Rush. P. May—June. Gawthorpe, &c.

L. pilosa, Willd. Broad-leaved Hairy Wood Rush. P. March—May. Gawthorpe, &c.

L. campestris, Br. Field Wood Rush. P. March—May. Common. The variety *congesta* occurs at Ryhill.

ORDER—ALISMACEÆ.

ALISMA. *Linn.* Water Plantain.

A. plantago. L. Greater Water Plantain. P. June—August. Common.

A. ranunculoides, L. Lesser Water Plantain. P. May—July, "Wakefield, canal near Heath." (Miall & Carrington.)

SAGITTARIA. *Linn.* Arrow Head.

S. sagittifolia. L. Common Arrow Head. P. July—September. Brotherton (Mr. Roberts.) Hiendley, Walton, Darfield.

BUTOMUS. *Linn.* Flowering Rush.

B. umbellatus, L. Common Flowering Rush. P. June—July. Hemsworth Dam (Mrs. Watson), formerley found in the stream below Porto Bello, Wakefield. (Mr. C. F. Tootal.)

ORDER—TYPHACEÆ.

TYPHA. *Linn.* Cat's Tail, or Reed Mace.

T. latifolia, L. Great Reed Mace. P. July—September. Ryhill, Walton, Darfield, &c.

SPARGANIUM. *Linn.* Bur Reed.

S. ramosum, Huds. Branched Bur Reed. P. July. Frequent.

S. simplex, Huds. Unbranched Bur Reed. P. July. Stanley Canal.

ORDER—ARACEÆ.

ARUM. *Linn.* Cuckoo-pint, &c.

A. maculatum, L. Cuckoo-pint, Wake-robin, &c. P. April—June. Common.

ACORUS. *Linn.* Sweet-sedge.

A. Calamus, L. Common Sweet-sedge. P. July—September. Winterset, (Mrs. Watson), Sandal, Walton, &c. The root of this plant is much used in perfumes, on account of its delicate aromatic odour.

ORDER—LEMNACEÆ.

LEMNA. *Linn.* Duckweed.

L. trisulca L. Ivy-leaved Duckweed. A. June—August. Frequent.

L. minor, L Lesser Duckweed. A. July. Common.

L. polyrhiza. L. Greater Duckweed. A. Alverthorpe.

ORDER—NAIADACEÆ.

POTAMOGETON. *Linn.* Pondweed.

P. pectinatus, L. Fennel-leaved Pond-weed. P. June—August. Common. The form *P. filiformis*, occurs in the Barnsley Canal.

P. pusillus, L. Small Pondweed. P. July—August. Frequent.

P. gramineus, L. Grassy Pondweed. P. July. Barnsley Canal.

P. crispus, L. Crisped Pondweed. P. June—August. Common.

P. perfoliatus, L, Perfoliate Pondweed. P. July. Near Barnsley.

P. prælongus, Wulf. Long stalked Pondweed. P. July. Canal, Silkstone.

P. lucens, L. Shiny Pondweed. P. June—July. Nostel, &c.

P. natans, L. Broad leaved Pondweed. P. June—July. Common.

ZANNICHELLIA. *Linn.* Horned Pondweed.

Z. palustris, L. Common Horned Pondweed. A. August. Pond near the Union House, Wakefield.

(To be continued.)

Reports of Societies.

Amateur Botanists' Society.—At the annual meeting of this society, held in the School-room of St. Martin's-in-the-Fields, London, on Dec. 20th, 1865. A quarter-inch Object Glass, made by Messrs. Powell and Lealand, was subscribed for and given to Mr. Thos. Ketteringham, the late secretary, on his resigning that office. The officers for the ensuing year are as follows, viz. :—President, Mr. M. C. Cooke ; Vice-president, Mr. Sandman; Council, Messrs. R. G. Keeley, H. Sandman, Jacques, and Ralph Tate, F.G.S ; Librarian, Mr. A. Grugeon ; Treasurer, Mr. W. M. Bywater; Secretary, Mr. W. W. Reeves.

Observations.

Mildness of season at Market Harborough.—We have experienced an unusually mild winter at Market Harborough. A few days ago I saw several hybernated specimens of *V. urticæ* flying during sunshine in a sheltered garden, and in the same garden violets are flowering in profusion. There is at the time I write (January 3rd, 1866,) in a garden about a mile from the above town, an apple tree displaying its blossoms, and on it are actually formed some apples. Such a freak of nature as this is rarely to be met with, and is worth recording, as a proof of the extraordinary mildness of the weather at the above season.—T. Wilkinson, High-street, Market Harborough.

Notes and Queries.

Oidemia fusca.—Mr. S. Smith will find the bony *laryngeal cavities*, in the windpipe of this duck, fully described in Yarrell, 3rd ed., page 317, and figured in page 318. —Henry Reeks, Manor House, Thruxton, Jany. 8th, 1866.

Vespa Crabro and V. Norvegica.—I was much interested in Mr. Rowley's amusing account of the capture of a hornet's nest, and quite hoped to find, towards the conclusion of his note, that he had not only captured the "varmints" themselves, but had also taken the rare hornet-parasite, *Velleias dilatatus*. Mr. Rowley does not, however, even mention having searched for it. Was he not aware of the existence of this curious Coleopteron? If Mr. R. should chance to be in the neighbourhood of the original site of the nest, it would most probably repay him to make a careful search among the *débris* at the far end of the hole in the thatch, as this rare insect is supposed to hybernate in the immediate vicinity of the nest in which it has served its economy. The English collection in the British Museum does not contain a specimen of this rarity, there are two specimens in the German collection. Mr. R. asks "how many hornet's stings would kill a man?" This would depend entirely on two things, viz., the state of the man's blood, and the part stung. I recollect a case, which occurred a few years ago in Berkshire, in which a poor man lost his life by being stung on the back of the neck, near the head, by a single bee, I do not think the sting of the hornet more poisonous than that of the hive-bee. Mr. Rowley also mentions having captured a nest of *V. Brittanica*. Did Mr. R. examine the inmates? If not, I think he had far better label the nest *V. sylvestris* ; there is certainly no way of telling the nests from each other, without an examination of the insects.—Henry Reeks, Manor House, Thruxton.

Original Articles.

ES FROM A NATURALISTS' CALENDAR, KEPT IN THE SOUTH OF ENGLAND, DURING THE YEAR 1865.

By Anthony S. Bradby.

January 1st—Robin, *Sylvia rubecula*, sings.

9th—Starling, *Sturnua vulgaris*. Seen in flocks, and are often heard uttering their whistling note, whilst perched on the leafless trees. I have observed that in this neighbourhood the Starlings are to be seen in flocks nearly all the year round; even in the breeding season I have seen large flocks retire to roost in the willow beds near the river's side, at Stratford St. Anthony in Wiltshire.

15th—Ring Dove, *Columba palumbus*, coos.

16th—Chaffinch, *Fringilla cœlebs*, sings.

20th—Partridges, *Perdix cinerea*, pair.

March 1st—Rooks, *Corvus frugilegus*, return to their breeding places to roost. The rooks leave us every evening all through the winter months to roost in larger or more sheltered rookeries, they are generally here at dawn every morning and do not leave till late in the afternoon or evening. About building time they always return here to roost at night.

3rd—Stock Dove, *Columba œnas*, heard. The Stock Doves frequent the rookery trees here; I hear them nearly every morning all through the spring and summer.

4th—Rooks, *Corvus frugilegus*, build.

18th—Peacock Butterfly, *Vanessa Io*. seen.

18th—Sweet Violet, *Viola odorata*, in flower.

April 1st—Gooseberry leaves unfold.

1st—Small Bat, *Scotophilus murinus*, appears.

5th—Chimney Swallow, *Hirundo rustica*, appears. Wheatear, *Saxicola œnanthe* appears. I saw lots of Wheatears at Stratford St. Anthony, near Salisbury on the 5th; on the 6th however, I saw but two or three.

6th—Blackbird, *Turdus merula*, lays.

6th—Lapwing, *Vanellus cristatus*, lays.

7th—Young Rooks hatched (Wiltshire.)

9th—Cowslip, *Primula veris*, in flower.

9th—Hawthorn leaves unfold.

13th—Common Elm, Dog Rose and Sweetbriar leaves unfold.

14th—Whitethroat, *Sylvia cinerea*, appears.

14th—Sedge Warbler, *Sylria phragmitis*, appears.

16th—Blackthorn in flower.

16th—Yellow Bunting, *Emberiza citrinella*, builds.

17th—Cuckoo, *Cuculus canorus*, heard.

18th—Pear Tree in flower.

21st—House Martin, *Hirundo urbica*, appears;

21st—Stone Curlew, *Œdicnemus crepitans*, heard.

22nd—Whinchat, *Saxicola rubetra*, appears.

22nd—Beech leaves unfold.

25th—Corn Crake, *Crex pratensis*, heard.

26th—Turtle Dove, *Columba turtur*, appears.

26th—Cow Parsley, *Melampyrum pratense*. in flower.

28th—Swift, *Cypselus apus*, appears.

28th—Lilac, *Syringa vulgaris*, in flower.

28th—Orange Tip Butterfly appears.

28th—Common Sandpiper, *Totanus hypoleucos*, appears.

May 8th—Woodpigeon, *Columba Palumbus*, hatches.

8th—Whitethroat, *Sylvia cinerea*, sitting.

8th—Whitethorn in flower.

28th—Young Pied Wagtails fledged.

June 1st—Small Heath Butterfly appears.

1st—Bedford Blue Butterfly appears. *Polyomatus alsus*, was unusually plentiful in Wiltshire this season, I think I never observed so many before.

7th—Meadow Brown Butterfly appears.

October 5th—Landrail, *Crex pratensis*, last seen.

7th—Rooks leave Moundsmere and resort to larger rookeries to roost.

13th—Clouded Yellow Butterfly, *Colias edusa*, last seen. I saw several butterflies of this species about here this season, as late as September and October. I only caught two specimens that would do for the cabinet.

November 14th—Chimney Swallow, *Hirundo rustica*, last seen. I saw a single Chimney Swallow to-day, it was flying across a field within a quarter of a mile of the place where I have more than once seen the Swallow for the first time in spring.

December 10th—Blackheaded Bunting, *Emberiza schœniclus*, first

observed at Moundsmere. The Blackheaded Bunting so far as I have observed, is not to be seen about here all the summer, but in the autumn and winter I see many in this neighbourhood. I am at present unable to account for this in any satisfactory way. Has it been noticed by any other reader of the *Naturalist ?*

15th—I saw a Woodcock, *Scolopax rusticola*, in a wood near here to-day. As far as my observation goes I fancy the Woodcocks were rather late in arriving in this part of Hampshire this season as I did not hear of any being seen till November 26th, and on the 27th three were shot ; I did not see one myself till to-day.

16th—I fancy I saw some Bramblings, *Fringilla montifringilla*, to-day, they were perched on a hedge amongst some Chaffinches, but as they flew off before I got well up to them I cannot be certain that they were not some other species.

28th—Golden Plover, *Charadrias pluvialis*, appears. I saw a flock of these birds fly over Preston Oak Hills, about 10 o'clock this morning, they flew in an easterly direction. The flock was composed of about twenty or thirty birds.

Moundsmere, Micheldever, Hants, January 1st, 1866.

NATURAL ENGINEERING.

By Thomas Graham Ponton.

Before me lies a block of sandstone of about five inches square. Such a piece of stone would, under ordinary circumstances, weigh about nine or ten ounces, the block in question, however, weighs only five ounces and a half. How is this ? The cause is apparent ; it is riddled by large holes or burrows, and it is but a small portion of a large mass of rock, and that mass of rock one of a series of masses ; all similarly perforated through and through in every direction.

Also before me lies a piece of wood, which has a similar deficiency in weight, and from the same cause, it is perforated throughout. That piece of wood was a portion of one of the supports of a wooden pier, and each of those supports was similarly riddled with holes. Here then, there is clearly some wonderful natural agency at work, destroying our piers, ar . under-

mining the rocks of our shores, as completely as the most scientific system of engineering could do.

What are the engineers? and what wonderful instrument do they employ? The engineers, are various kinds of bivalve mollusca, and the instrument used is a portion of their own body. In fact all these strange holes, and burrows are the work of animals with soft gelatinous bodies, protected by shells which, although hard, are at the same time very brittle. It is no wonder then, that admiration and curiosity has long been excited by these strange rock-boring animals, and that their mode of working has been a favourite bone of contention between rival naturalists.

Four theories for accounting for this excavation by rock-boring mollusca have at different times found favour with naturalists, namely, that the excavations were effected :—1. By the aid of a chemical solvent ; or, 2. By absorption ; or, 3. By the assistance of ciliary currents ; or, 4. By the rotation of the animal.

The great difficulty connected with the first, that of a chemical solvent, is that these mollusca perforate all kinds of substances and it would be manifestly impossible to find an acid which would act on almost every known rock, as also on wood and wax ; and yet would have no effect on the valves of the shell. The absorption theory has never found much favour among naturalists, it is therefore unnecessary to dwell upon it. The third theory, that of ciliary currents, is discountenanced by the circumstance that very few if any of the rock-boring mollusca possess cilia, and it could therefore at the utmost apply to only a small number of them, and moreover it fails to explain all the phenomena exhibited.

The theory of rotatory motion, or of a rotatory motion combined in some instances with a process of rasping, is that now generally received. Independently however, of a rotatory motion being necessary, it is also required that there should be some means of carrying away the particles of wood or stone removed. All these various requirements are beautifully provided for in these mollusca.

The excavation of the burrow is chiefly accomplished by the *foot*, assisted to a small extent in some instances by the minute sharp teeth on the shell, as is clearly shown by the longtitudinal furrows on the sides of the perforation. In cases however, where the valves of the shell are perfectly smooth, the *foot* is the sole excavating organ. Let us now see how the foot is set in motion, and by what means the particles rubbed off are got rid of.

Under the hinge in each valve is a small spoon shaped process. These processes penetrate deeply into the wing shaped muscles of the mantle and foot. When the animal commences an excavation, the elastic muscular base of the foot is pressed against the block of wood or stone to be perforated, and having thus gained a point of support the animal begins to turn. Slowly the minute particles are rubbed, or rather, so to say, *licked* off until in process of time the burrow reaches a depth sufficient for the protection of the animal. In cases where the shell possesses sharp teeth as in the *Pholades* for instance, when the animal has excavated to a certain depth, by means of its foot, the valves come into play and materially assist in the enlargement of the burrow.

The great expansibility which it is necessary the foot of these animals should possess to enable them to perform their boring operations successfully, is owing to the presence in its interior of a curious organ called the *Hyaline stylite*. The existence of this extraordinary body has been long known, but its true nature was not discovered until the year, 1858, when the much vexed question as to its use in the economy of the animal was at length set at rest by the investigations of Mr. Robertson, of Brighton, who discovered that its sole object was to add elasticity to the foot. The *stylite* is cylindrical, about the twentieth of an inch in diameter at its thickest part, and generally about an inch in length, it is quite transparent and highly elastic; it lies along the sole of the foot, in a case or sheath of muscles. The base of this glass-like spring is contained in a cup held in by the border muscle of the foot, and the socket containing the point is a horny cup, controlled by the muscles of the sheath which are connected with those of the back. The narrow end of the spring is spiral, and it is enclasped by the flaps of the socket.

Still it was not enough that these animals could scoop out their holes, they must have some means of getting rid of the particles removed. This is thus performed; the particles of wood or stone are collected into the mantle, and the foot then suddenly swells, and forces the particles mixed with water through the siphons and they are thus expelled. Such is the mode employed by these engineers of nature to form their excavations; and thus the cycle is perpetually kept up. The coral polypes, nature's builders, on the one hand, forming reefs, islands, and continents; the mollusca nature's engineers, on the other hand, destroying piers and breakwaters, undermining rocks and cliffs. But whether for creation or destruction, still ever wonderful and ever perfect are the ways in which nature works.

THE VEGETATION OF SPITZBERGEN COMPARED WITH THAT OF THE ALPS AND PYRENEES.

By Chas. Martins,

Prof. of Natural History, and Director of the "Jardin des Plantes, &c,. at Montpellier.

(Concluded from page 206.*)*

Part V.

This article would not be complete if we did not cast a passing glance to the Pyrenees, in order to ascertain if the arctic *flora* has left any representatives there since the retreat of the glaciers which, in this chain as in all the others descended far into the plains, both in France and Spain.

The vegetation of the Pyrenees closely resembles that of the Alps. M. Zetterstedt * counts in all sixty-eight *Alpine* plants common to the Pyrenees, the Alps, and the Scandinavian mountains, and one only *Menziesia* (*Phyllodoce*) *cœrulea*, which is only found in Scandinavia and the Pyrenees.

Ramond, after thirty-five ascents of the Pic du Midi de Bagnères, during fifteen years, and comprised in the season between the 20th July and 7th October, applied himself to collecting all the plants of the terminal cone, the height of which is sixteen metres (fifty-two feet), the summit being 2877 metres (9172 feet), above the level of the sea, and having an area of some few acres only ; he there found seventy-one flowering plants. This list is pretty complete, the later researches of other botanists not having added to it. M. Charles Desmoulins, who made the ascent on the 17th October, 1840, only cites *Stellaria cerastoides* as having escaped the searching eyes of Ramond. I annex the list of these plants, extracted from the Memoire of Ramond, (which is now very scarce), preserving the names of this author † to which, I have added some synonyms in order to make it uniform with the preceding lists.

Phanerogamia of the Summit of the Pic du Midi de Bigorre.

[N.B.—The plants in italics are also found at the Jardin de la mer de Glace at Chamounix ; those marked with an asterisk in Lapland.]

Papaveraceæ. Papaver pyrenaicum, D.C.

Cruciferæ. Draba aizoides, Willd. ; D. nivalis, Willd. ; D. pyrenaica,

* Plantes vasculaires des Pyrénées principales, 1857.

† Etat de la Vegetation au sommet du pic du Midi, (Mem. de l' Acad. des Sciences de Paris, Tome VI. p. 81. 1827.)

Willd. (Petrocallis pyrenaica, D.C.) ; Lepidium alpinum, (Hutchinsia alpina, D. C.) ; Iberis spathulata, (Thlaspi rotundifolium, Gaud.) ; Sisymbrium pinnatifidum, D.C.

Caryophyllaceæ. Silene acaulis, * L. ; Lychnis alpina, * Willd. ; Arenaria ciliata, Willd. ; A. verna, Willd. (Alsine verna, Bartl.) ; Cherleria sedoides, Willd. ; *Stellaria cerastoides*, L. ; Cerastium squalidum, Ram., (C. latifolium, * L.)

Leguminosæ. Lotus alpinus, Schl. ; Anthyllis vulneraria, D.C. ; Astragalus campestris, Willd. (Oxytropis campestris, D.C.) ; A. (Oxytropis) montanus, Willd.

Rosaceæ. *Sibbaldia procumbens*, L. ; Potentilla nivalis, Lapeyr. ; P. filiformis, D.C. ; Alchemilla hybrida, L. (A. vulgaris, *), Willd.

Crassulaceæ. Sempervivum montanum, Willd. ; S. arachnoideum, Willd ; Sedum repens, Sch. ; *S. atratum*, Willd.

Saxifragaceæ. Saxifraga grænlandica, D.C. (S. cœspitosa, β. Retz.) ; S. petræa, Willd. ; S. oppositifolia, * L. ; S. bryoides, Willd.

Rubiaceæ. Galium cœspitosum, Ram. ; G. pyrenaicum, Gouan.

Compositæ. Bellis perennis, Willd. ; *Erigeron uniflorus*, * L. ; *E. alpinus*, * Willd. ; *Pyrethrum alpinum*, Willd. ; Chrysanthemum montanum, Willd. ; (C. leucanthemum, D.C.) ; Gnaphalium norvegicum, * Retz. (G. sylvaticum,) Sm., ; G. supinum, Willd. ; (*Omolotheca supina.* * Cass.) ; Arnica scorpioides, D.C. ; Artemisia spicata, Willd. ; Leontodon lævigatus, Willd. (*Taraxacum lævigatum*, D.C. ; Hieracium prunellæfolium, Gouan.) ; Apargia alpina, Willd. (*Leontodon squammosum*, Lam. ; L. pyrenaicum, Gouan.)

Campanulaceæ. *Phyteuma hemisphericum*, Willd.

Primulaceæ. Primula integrifolia, Willd. ; Androsace ciliata, D.C. ; A. villosa, Willd. A. carnea, β. Halleri, Willd.

Gentianaceæ. Gentiana verna, *var. a.* Frœcl. ; G. alpina, Willd. (*G. acaulis*, γ, D.C.)

Boraginaceæ. Myostis pyrenaica, Pourr. (M. alpestris, Schm. ; M. perennis, γ, D.C.)

Scrophulariaceæ. Linaria alpina, D.C. ; Veronica nummularia, Gouan. ; V. saxatilis, * Willd. ; Pedicularis rostrata, Willd.

Labiatæ. Thymus serpyllum, L.

Plantaginaceæ. Plantago alpina, L.

Plumbaginaceæ. Statice armeria, L. ; (Armeria alpina, Willd.)

Polygonaceæ. Rumex digynus, Willd. (Oxyria digyna * Cambd.)

Salicaceæ. Salix retusa, * Willd.

Cyperaceæ. *Carex curvula*, All. ; C. ovalis, Good. ; C. nigra, All.

Graminaceæ. Agrostis alpina, Willd. ; Avena sempervirens, Willd. (A. striata, Lam.) ; Poa cenisia, * All. ; *P. alpina*, Willd. ; Festuca eskia, Ram. ; F. violacea, Gaud. ; Aira subspicata, L. (Trisetum subspicatum, P. Beauv.)

Of these seventy-two species growing between the elevations of 2860 metres (9117 feet), and 2877 metres (9172 feet), there are thirty-five which are also found in the Faulhorn * ; and fifteen, printed in italics, at the Jardin de la Mer de Glace de Chamounix. I have counted thirteen, which are also found *in all three* localities, viz :—*Stellaria cerastoides*, *Cerastium latifolium*, *Sibbaldia procumbens*, *Erigeron uniflorus*, *E. alpinus*, *Omolotheca supina*, *Poa alpina*, *Phyteuma hemisphericum*, *Gentiana acaulis*, *Linaria alpina*, *Plantago alpina*, *Carex curvula*, *Agrostis alpina*. Of these thirteen plants, the first seven are also found in the north, a new proof of the common origin of the most widely spread alpine and Pyrenean species. The six last are essentially alpine forms. Fourteen Lapland species, marked with an asterisk, make part of the florula of the Pic du Midi ; this is at the rate of twenty per cent, consequently less than for the Faulhorn and the Jardin. But of these thirteen species, four grow also on the shores of Spitzbergen, viz :—*Oxyria digyna*, *Erigeron uniflorus*, *Silene acaulis*, and *Saxifraga oppositifolia*, and three others, *Poa cenisia*, *Draba nivalis*, and *Arenaria ciliata*, are missing in Lapland, but are found both on the Pic du Midi in 43° N. Lat., and above 2860 metres (9117 feet) and in Spitzbergen, under the 78° N. Lat., at the level of the sea. Relatively to the the total number of species, the flora of the Pic du Midi is richer in arctic plants than that of the Faulhorn or the Jardin, for their proportion is ten per cent. against five per cent. for the alpine summit and the glacial island. Should this difference be attributed to the greater elevation of the Pic, or to other circumstances connected with the ordinary distribution of plants ? This question can scarcely be answered in the present state of our knowledge ; but this resemblance in the vegetation of three points so far removed from each other, proves a community of origin, and consequently a common basis of vegetation, which has been modified according to circumstances depending on climate, geographical position, of a mixture of plants of neighbouring countries, or even of species derived from those of the later geological floras, of which we find the remains in the most recent formations.

* The species printed in italics in the Faulhorn list, p.p. 172—3.

A FEW PLANTS OBSERVED NEAR CLIFTON, BRISTOL.

July, 1865.

By Elizabeth Chandler.

The following list is arranged in accordance with the London Catalogue.

Clematis Vitalba, Clifton Downs, &c.

Coronopus didyma, By the New Cut, Bristol.

Cheiranthus Cheiri, St. Vincent's Rocks.

Sinapis tenuifolia, Gravel-path near Cook's Folly.

S. muralis, Walls and Cliffs. Common.

Linum usitatissimum, High banks just past the Suspension Bridge.

Hypericum montanum, Abundant in the preceding locality.

Geranium columbinum, Frequent.

Sedum Telephium, St. Vincent's rocks.

Apium graveolens, Banks of the Avon near the Clifton Ferry, on the Somersetshire side.

Petroselinum sativum, Abundant on the Cliffs.

Fœniculum vulgare, On the Cliffs. Frequent.

Torilis nodosa, Clifton Downs.

Rubia peregrina, Cliffs near St. Vincent's rocks.

Centranthus ruber, With the preceding.

Erigeron acris, Cliffs and walls, very common.

Aster Tripolium, Muddy beach of the Avon, on the Somersetshire side.

Solidago Virgaurea, Cliffs, abundant.

Inula Conyza, Roadsides, frequent.

Chlora perfoliata, On the Cliffs.

Veronica spicata, St. Vincent's rocks.

Antirrhinum majus, With the preceding.

Linaria Cymbalaria, St. Vincent's rocks and neighbouring cliffs.

L. minor, Banks of the railway, by the river Avon.

Orobanche hederæ, On Ivy, St. Vincent's rocks.

Verbena officinalis, Roadsides, frequent.

Salvia verbenaca, St. Vincent's rocks.

Teucrium Scorodonia, Cliffs and roadsides.

Cynoglossum officinale. Downs above White Lady Valley.

Glaux maritima, With *Aster Tripolium*.

Mercurialis annua, Waste ground and Railway banks, frequent.

Triglochin maritimum, With *Aster Tripolium*.

High Wycombe.

MATERIALS FOR A FLORA OF WAKEFIELD AND ITS NEIGHBOURHOOD.

By T. W. Gissing.

(Concluded from page 271.)

Sub-Class II.—GLUMACEÆ.

Order—CYPERACEÆ.

Scirpus. *Linn.* Clubrush, &c.

S. palustris, L. Creeping Spike rush. P. June—August. Common.

S. cæspitosus, L. Tufted Spike rush. P. June—July. Heath, Woolley. &c.

S. setaceus, L. Bristle Spike rush. P. July—August. Gorse Hill, &c., near Wakefield.

S. lacustris, L. Bullrush. P. July—August. New Miller Dam.

S. sylvaticus, L. Wood Clubrush. P. July. Woolley.

Eriophorum. *Linn.* Cotton Grass.

E. angustifolium, Roth. Narrow leaved Cotton Grass. P. May—June. Ryhill, Woolley.

Carex. *Linn.* Sedge.

C. dioica, L. Dicœcious Carex. P. May—June. Woolley, Ryhill. Sharlestone.

C. ovalis, Good. Oval spiked Carex. P. June. Heath, &c.

C. stellulata, Good. Star-headed Carex. P. May—June. Heath, &c.

C. remota, L. Distant Spiked Carex. P. June. Common.

C. axillaris, Good. Axillary Clustered Carex. P. June. I have this species noted but with no locality attached, *I believe* it was found near Silkstone.

C. paniculata, L. Great Panicled Carex. P. June. New Miller Dam.

C. vulpina, L. Great Carex. P. June. Common.

C. muricata, L. Greater Prickly Carex. P. May—June. Frequent.

C. intermedia, Good. Soft Brown Carex. P. June. Stanley.

C. acuta, *L.* Slender spiked Carex. P. May. Stanley.

C. cæspitosa, L. Tufted Bog Carex. P. April—June. Frequent.

C. flava, L. Yellow Carex. P. May—June. Heath, Woolley, Ryhill, &c.

C. lævigata, Sm. Smooth stalked Beaked Carex. P. June. New Miller Dam.

C. panicea, L. Pink leaved Carex. P. June. Near Wintersett Reservoir.

C. sylvatica, Huds. Pendulous Wood Carex. P. May—June. New Miller Dam, &c. In woods.

C. glauca, Scop. Glaucous Heath Carex. P. June. Woolley, Heath, Outwood, &c.

C. præcox, Jacq. Spring Carex. P. April—May. Common.

C. pilulifera, L. Round headed Carex. P. June. Frequent on moors.

C. hirta, L. Hairy Carex. P. May—June. Ryhill, &c.

C. vesicaria, L. Short beaked Bladder Carex. P. May—June. New Miller Dam.

C. paludosa, Good. Lesser Common Carex. P. May. Frequent. Stanley, &c.

C. riparia, Curt. Great Common Carex. P. May. Common.

ORDER—GRAMINACEÆ.

ANTHOXANTHUM. *Linn.* Vernal Grass.

A. odoratum, L. Sweet scented Vernal grass. P. May. Common. The odorous principle of this grass is supposed by some to be the cause of that disagreeable disease, Hay fever.

NARDUS. *Linn.* Mat Grass.

N. stricta, L. Mat Grass. P. June. Heaths and Moors. Common.

ALOPECURUS. *Linn.* Fox-tail Grass.

A. pratensis, L. Meadow Fox-tail Grass. P. May—June. Meadows. Common.

A. agrestis, L. Slender Fox-tail Grass. A. June. Fields. Frequent.

A. geniculatus, L. Floating Fox-tail Grass. P. July. Wet places and in pools.

PHALARIS. *Linn.* Canary Grass.

P. canariensis, L. Canary Grass. A. July. Balne Lane near Wakefield, (1856); Crigglestone, (1858). In neither place, truly wild.

P. arundinacea, L. Reed Canary Grass. P. July—August. Common.

PHLEUM. *Linn.* Cat's-tail Grass.

P. pratense, L. Common Cat's-tail, or Timothy Grass. P. June. Common.

MILIUM. *Linn.* Millet Grass.

M. effusum, L. Spreading Millet Grass. P. June. Woods. Frequent.

AGROSTIS. *Linn.* Bent Grass.

A. canina, L. Brown Bent Grass. P. June. Common.

A. vulgaris, With. Fine Bent Grass. P. June. Common.

A. alba, L. Marsh Bent Grass. P. July. Common. These grasses, more particularly *A. vulgaris*, are the farmer's pests under the names of Spear-grass, Twitch, Wicks, &c.

CATABROSA. *Beauv.* Whorlgrass.

C. aquatica, Beauv. Water Whorlgrass. P. May—June. Frequent.

AIRA. *Linn.* Hair Grass.

A. cæspitosa, L. Tufted Hair Grass. P. June—July. Borders of fields and damp places.

A. flexuosa, L. Waved Hair Grass. P. June. Moors and Heaths.

A. caryophyllea, L. Silvery Hair Grass. P. June—July, Heaths.

A. præcox, L. Early Hair Grass. A. May—June. Common.

MELICA. *Linn.* Melic Grass.

M. uniflora, L. Wood Melic Grass. P. May—July. Frequent in woods.

M. nutans, L. Mountain Melic Grass. P. May—June. Ackworth (Mrs. Watson.)

HOLCUS. *Linn.* Soft Grass.

H. mollis, L. Creeping Soft Grass. P. July. Frequent.

H. lanatus, L. Meadow Soft Grass. P. June—July. Frequent.

ARRHENATHERUM. *Beauv.* Oat-like Grass.

A. avenaceum, Beauv. Common Oat-like Grass. P. June—July. Frequent.

SETARIA. *Beauv.* Bristle Grass.

S. viridis, Beauv. Green Bristle Grass. P. July—October. Near Wakefield, (1859.)

POA. *Linn.* Meadow Grass.

P. aquatica, L. Reed Meadow Grass. P. July—September. By rivers, canals, &c.

P. fluitans, Scop. Floating Meadow Grass. P. July—September. Common. The variety *P. plicata*, is sometimes found.

P. rigida, L. Hard Meadow Grass. A. June. Heath, Woolley, &c. On old walls, roadsides, &c.

P. annua, L. Annual Meadow Grass. A. April—August. Common.

P. pratensis, L. Smooth Stalked Meadow Grass. P. June—July. Frequent.

P. trivialis, L. Roughish Meadow Grass. P. June—July. Common.

BRIZA. *Linn.* Quaking Grass.

B. media, L. Common Quaking Grass. P. June. Common.

DACTYLIS. *Linn.* Cock's Foot Grass.

D. glomerata, L. Rough Cock's foot Grass. P. June—July. Common.

CYNOSURUS. *Linn.* Dog's tail Grass.

C. cristatus, L. Crested Dog's tail Grass. P. July. Common.

FESTUCA. *Linn.* Fescue-grass.

F. ovina, L. Sheep's Fescue Grass. P. June—July. Common. The variety *F. duriuscula*, is likewise found.

F. pratensis, Huds. Meadow Fescue-grass. P. June—July. Frequent.

BROMUS. *Linn.* Brome Grass.

B. giganteus, L. Large Brome Grass. F. July—August. Frequent in moist woods.

B. asper, L. Hairy Wood Brome Grass. A. or B. June—July. Frequent.

B. sterilis, L. Barren Brome Grass. A. June. Frequent.

B. mollis, L. Soft Brome Grass. A. or B. June. Common.

B. racemosus, L. Smooth Brome Grass. A. or B. June. Ackworth, (Mrs. Watson.) Mr. Bentham makes the two last forms, with one or two others, varieties of *B arvensis*.

AVENA. *Linn.* Oat or Oatgrass.

A. fatua, L. Wild Oat. A. June—August. Kippax, (Baines' Flora of Yorkshire.)

A. flavescens, L. Yellow Oat Grass. P. July. Common.

ARUNDO. *Linn.* Reed.

A. Phragmites, L. Common Reed. P. July—August. Common by ponds reservoirs, &c.

HORDEUM. *Linn.* Barley.

H. pratense, Huds. Meadow Barley. A. June—July. Near Pontefract.

H. murinum, L. Wall Barley. A. June—July. Common.

TRITICUM. *Linn.* Wheat Grass.

T. repens, L. Creeping Wheat Grass. A. June—August. Common.

T. caninum, Huds. Fibrous-rooted Wheat Grass. P. July. Frequent.

BRACHYPODIUM. *Beauv.* False Brome Grass.

B. sylvaticum, Beauv. Slender False Brome Grass. P. June—July. Haw Wood, New Miller Dam.

B. pinnatum, Beauv. Heath False Brome Grass. P. July. Kippax.

LOLIUM. *Linn.* Darnel.

L. perenne, L. Perennial Darnel, or Rye-grass. P. or B. June—July. Common.

Class III.

ACOTYLEDONOUS OR CELLULAR PLANTS.

Filices.

Polypodium. *Linn.* Polypody.

P. vulgare, L. Common Polypody. Heath, Purston. The variety *P. serratum*, grows at Purston.

P. Dryopteris, L. Tender Three Branched Polypody, or Oak Fern. Netherton, Lofthouse, Heath, (I believe now destroyed), Soothill Wood, (S. Bruce, Esq., L.L.B.)

Allosurus. *Bernh.* Parsley Fern.

A. crispus, Bernh. Parsley Fern, or Rock Brake. Heath, near Wakefield. Discovered by W. S. Banks, Esq., since destroyed or buried.

Polystichum. *Roth.* Shield Fern.

P. aculeatum, Roth. Common Prickly Shield Fern. Ardsley, Wentbridge. The *P. lobatum*, is found at Wentbridge.

P. angulare, Presl. Soft Prickly Shield Fern. Nostel. (Mr. Watson.)

Lastræa. *Presl.* Buckler Fern.

L. Oreopteris, Presl. Mountain Buckler Fern. Hemsworth, (T. M. K. Hughes, Esq.) Netherton.

L. Filix-mas, Presl. Male Fern. Common. The variety *L. incisa*, as well as bifid and much divided forms are often found.

L. spinulosa, Presl. Prickly Buckler Fern. Soothill Wood, Ardsley, Langley Wood, New Miller Dam, Streethouse, Haw Park, &c., &c. A variety occurs in Soothill Wood, with very contracted pinnules, in some instances scarcely toothed and almost spineless and dying off much earlier than the normal form.

L. dilitata, Presl. Broad Prickly Buckler Fern. Common.

Athyrium. *Roth.* Lady Fern.

A. Filix-fœmina, Roth. Lady Fern. Frequent. The varieties *A. convexum*, and *A. incisum*, are frequent.

Asplenium. *Linn.* Spleenwort.

A. Trichomanes. L. Wall Spleenwort. Nostel, New Miller Dam, Womersley, Heath.

A. Adiantum-nigrum, L. Black Spleenwort. Royston, Nostel, Lofthouse, (Mr. Forrest.)

A. Ruta-muraria, L. Wall-rue Spleenwort. Womersley, Sandal, Thornes, New Miller Dam, Nostel, Stanley, Heath.

SCOLOPENDRIUM. *Sm.* Hart's Tongue.

S. vulgare. Smith. Common Hart's Tongue. Nostel, New Miller Dam, Thornes, Horbury, &c. Formerly plentiful in Hell Lane, near Heath, but I believe now eradicated. Moore in the First Edition of "Nature printed Ferns."—gives *sixty-six* varieties of this fern and I believe clever cultivators make more.

BLECHNUM. *Linn.* Hard Fern.

B. boreale, Swartz. Northern Hard Fern. Ardsley, Ackworth, Heath. The varieties *B. bifidum,* and *multifidum* are sometimes found.

PTERIS. *Linn.* Brake or Bracken.

P. aquilina, L. Common Brake. Common. Much used for domestic and other purposes, such as thatching, fuel, bread, litter, food for pigs, &c , &c.

BOTRYCHIUM *Swartz.* Moonwort.

B. Lunaria, Swartz. Moonwort. Stanley, Featherstone, Lofthouse.

OPHIOGLOSSUM. *Linn.* Adder's Tongue.

O. *vulgatum,* L. Adder's Tongue. Frequent. It is occasionally found with the spike forked.

LYCOPODIACEÆ.

LYCOPODIUM. *Linn.* Club Moss.

L. clavatum, L. Common Club Moss. Found at Heath by Mr. C. F. Tootal Woolly Edge.

L. Selago, L. Fir Club Moss. Found at Heath by W. S. Banks, Esq.

EQUISETACEÆ.

EQUISETUM. *Linn.* Horse Tail.

E. Telmateia, Ehrh. Great Water Horse Tail. Haw Wood, Gawthorpe.

E. arvense, L. Field Horse Tail. Common.

E. sylvaticum, L. Wood Horse Tail. Hiendley, Stanley, &c.

E. palustre, L. Marsh Horse tail. Walton, &c.

E. limosum, L. Smooth Horse tail. Frequent.

Cystopteris fragilis, (Brittle Bladder Fern) was some time since reported to me from Woolley, but from a subsequent explanation I believe the plant was taken from a rockery in the garden at Woolley Park.

CHARACEÆ.

CHARA. *Linn.* Chara.

C. translucens, Pers. Translucent Chara. July—September. The reservoir at Wintersett.

C. vulgaris, L. Common Chara. In ponds, varying very much in appearance.

Reports of Societies.

Richmond and North Riding Naturalists' Field Club.—The usual monthly meeting of this club was held on Tuesday, when the President (E. Wood, F.G.S.) who was in the chair, exhibited a slab formed of the fossil *Ammonites planicostatus*, as also one of *Extracrinus briareus* both from the lias of Lyme Regis. He also exhibited a quantity of flint instruments from Bridlington, some fine specimens of the mistletoe, and the teeth of a rabbit which had grown to upwards of an inch in length curved. Mr. L. Bradley, F.G.S., exhibited a block of limestone from the bed of the river Swale, which contained a curious fossil, resembling a fish in shape. Mr. J. Aspdin exhibited a series of marine shells from Guernsey, as also some fresh water shells from the Ripon canal. He also announced to the meeting the presentation by Captain R. Thompson to the museum of a piece of wood cut from the tree against which the unfortunate women and children were dashed by the sepoys at the Cawnpore massacre in 1857 ; also a quantity of butterflies and moths presented by Mr. John Sang, of Darlington, to both of whom the meeting accorded a vote of thanks for their donations. Mr. T. Thompson sent for exhibition a very large specimen of the common oyster *(Ostrea edulis)* which was encrusted over with various substances. The President announced as donations from the Rev. Scott F. Surtees some very curious old books, and other articles of interest, for the museum, to whom a unanimous vote of thanks was accorded by the meeting. The meeting then adjourned to the second Tuesday in February.—J. Aspdin, Hon. Sec.

Society of Amateur Botanists.—At the meeting of the society of Amateur Botanists held in London on Jan. 3rd, a very curious specimen of *Geum rivale* was presented to the herbarium by Mr. Edwin Green, in which a flower is disposed in a whorl about the stem two inches below the terminal one. The next meeting will be held on the 7th of February, at the national schools, St. Martin's-in-the Fields.

Observations.

S. rubecula.—I have noticed a great many observations, from time to time, of the early nesting of some of our British Birds. The first instance presented to my own personal notice was the other day, when I received information that a robin was sitting on five eggs at Mr. Peto's farm, near Cookham. This was about the 7th January, and is an instance of the mildness of the season.—R. B. Sharpe, 20 Harwood Terrace, Kings Road, Fulham, S.W.

Exchange.

Shells and Insects.—Duplicates.—A few pairs of good specimens of *A. atropos, P. machaon, E. blandina, P. geryon, L. muscerda, Griseola, Stramineola, A. plantaginis, B. calunæ, S. carpini (pupæ), L. pudorina, D. capsincola, T. pastinum, C. spartiata*, and many others. Wants.—*P. Daplidice, C. Hyale, A. Lathonia, V. Antiopa, E. Cassiope, T. W. album, T. pruni, T. betulæ, P. hippothoe, L. acis, H. paniscus, Actæon.* No insect will be sent until those exchanged for them are received. I have also a number of British shells, in duplicate, which I should be glad to exchange for *P. obtusale, H. similis, G. maculosus, H. lamellata, P. minutissima, alpestris, pusilla, angustior, moulinsiana C. Rolphii, S. oblonga, P. glaber, L. Burnettii, L. glutinosa.* Only good specimens, either of shells or insects, need be sent. I shall be happy to exchange shells for the insects named, or *vice versa*, or to collect *micros*, from our moors for any gentleman who may supply any of my wants mentioned.—Wm. Cash, Delph-street, Halifax.

Original Articles.

LETTER ADDRESSED TO M. FRANÇOIS CREPIN,

By M. Alexis Jordan.

Monsieur,—The appearance of the 5th fascicle of your "Notes Critiques" * shews with what ardour and success you continue your studies of the plants of Belgium. It is much to be desired that such zeal as yours should amongst ourselves, find many imitators. It seems to me that you would attain to results still grander for science, if you could put yourself in such a position as to enable you to compare living specimens of the plants which you bring under your judgment and above all to lay yourself out for some experiments upon them. In simply passing under review, as you have done, the opinions or descriptions of various authors, so as to compare them with each other, you are under the necessity of supposing, without certain proof, that these authors have described plants specifically identical, or that they have been equally conscientious and exact in describing them.

You very justly criticise MM. Bentham and Cosson for their arbitary reunion of species, which simply bears witness, as you say, to their complete ignorance of facts. But do you not also think, that in holding as suspected, or in reducing without any proofs, the species proposed by others, who have studied them comparatively, in the living state, and are assured by prolonged experiments of the stability of their characters, one equally encounters this reproach of ignorance? There are those with whom this ignorance of facts is somewhat voluntary. We often hear them appeal to experiments, when the experiments which they entreat, have already been made and even frequently repeated by competent observers. Being determined to take no account of any experiment which does not put right on their side, whatever fails them always requires doing.

In your "Considerations on Species" *apropos of one of my works* † where you have given expression to many truisms with regard to the Linnean School, I have to point out an inaccuracy, no doubt unintended, but still not the less grave, in your appreciation of my opinions, or rather of their basis. All my arguments repose, as on a solid foundation, on two facts, given by me as incontrovertible. The first is, that there exist numerous closely re-

* Notes sur quelques Plantes rares ou critiques de la Belgique. 5th fasc.

† *Vide* "Naturalist" Vol. i. page 345, *et seq.* and Vol. ii. p. 1., *et seq.*

lated vegetable forms, at present distinct, hereditary, irreducible, by our means of experiment ; the second, that amongst these related forms, the most closely related are those which grow spontaneously in the same places and under conditions of existence altogether identical.

You take due notice of the first of these two facts ; as to the second you pass it over in silence, and in such a manner, that your reader, without otherwise knowing the state of the question, would arrive at a very inexact idea, and would find nothing improbable in the hypothesis advanced by you, according to which the greater part of the allied species, which I have indicated, are very probably only *stational* varieties of one and the same type due to different conditions of existence, and which have acquired, during the lapse of centuries, a constancy, if not absolute, at least relative, in their distinctive characters. Whereas this very hypothesis falls of itself, and cannot be sustained if considered as an actual fact, and also upon what I have affirmed that those species truly most related, are ordinarily *social* species. It is necessary then to seek for another explanation of their existence. We ask, how have these forms which grow spontaneously, pêle-mêle, shewing themselves hereditary and unchangeable, been able to produce and fix themselves, if they are only varieties springing from one common type, the slight but constant differences which separate them not being attributable to any local influences ?

A simple and very natural explanation, which presents itself to the mind at first sight, is, to admit the original diversity of permanent closely allied forms, as specific types ; the one which I have adopted because it appeared to me impossible to find another of any value, and it is besides so fully satisfactory to reason. One cannot indeed conceive how the forms, which under our very eyes, do *not* vary, and in which no appreciable external cause has previously been sufficient to cause variation, should nevertheless be but varieties produced by the same type.

If we afterwards compare other allied forms, equally permanent, but placed in different situations, and if we ascertain that their differences are equal, or even superior, in importance to those which separate the *social* allied forms ; is it possible to attribute these differences to the sole influence of situation ? When the true measure of possible affinity of species is presented to us by the *social* forms, which we are forced to consider as specific types, can we reasonably admit that there exist in nature, in a wild state, simple varieties purely *stational*, the characters of which are often more important than, and always as constant as, those of true species.

Upon the whole, the value, as species, of *social* permanent forms of plants is manifestly proved by the single fact of their co-existence spontaneously in the same situation. That other forms, which grow isolated and which we are at first tempted to regard as *stational* varieties, become *stable*, is equally proved by the single fact of the relation which exists between their distinctive characters and those of the former.

I have waited for a long time but in vain, for those who are adverse to my opinions, to judge and appreciate the fact of the co-existence, in the same situation, of the most closely allied vegetable forms, and that they should at last give any explanation of it whatever. I always find them suppress and appear totally ignorant of this fact which is annoying to them. This silence on their part may be expedient and clever, but it also proves their embarrassment, and shews that they are not very certain in their opinion. After all one cannot for ever ignore a fact which is become notorious—palpable; a fact which strikes the eye of even a slightly serious observer, whose attention is aroused and turned in that direction. Pass through any forest, in the plains, or on the hills, and one cannot but remark the allied forms of the *Rubus fruticosus*, of Linneus growing together pêle-mêle. Besides, there are those of the old types of the genus *Hieracium* found growing together in the same locality. Again, we come across those of *Taraxacum officinale*, of *Draba verna*, and many other Linnean types which are unstudied aggregations of species rather than true species. Among the mountains, and above all in the south, where the vegetation is more varied as to species than in the north, although generally less luxuriant and rich in individuals of each species, the law of the distribution of allied species may be observed still more easily. The facts have need, doubtless, to be well known and established in order to take account of them; but when once this is done, their empire in the science will be irresistible; the systems which are more or less contrary to them must fall or harmonise with them.

Independantly of the facts which I have indicated and which every observer may easily verify if he will take the trouble, I would advance my own experiments. This I have good right to do, for to them I have given all my time, and I constantly employ three men in the care of a cultivation altogether botanical, exclusively directed to this point—the criticism of species. All this long and expensive labour tends towards this single question—to ascertain whether such and such a vegetable form is distinct or not from such and such others, and to know what constitutes their differences. I endeavour as much as possible in my experiments, to imitate nature

in order the better to appreciate how things go when allied forms develope themselves in the wild state. Here is an example of what I have observed in the country and what I have put in practice in my cultivations :—

In the woods of our granite hills where the allied forms of *Hieracium* of the types *murorum*, *sylvaticum*, and *sabaudum*, abound, when a partial clearing of them is commenced, the first year we see developed here and there a small number of individuals of the special forms of the locality. The next year if the ground remains cleared, the seeds which these individuals have raised almost all sprout up, and we then find hundreds of individuals of each respective form, all identical one with another, and presenting a characteristic facies, easily seen at first glance. The third year these same individuals become stronger, and there are many less new ones. In the succeeding years if the ground is left to itself the *Rubi* and other strong plants invade it, and the *Hieracia* eventually disappear almost entirely. The case I have above described is an exceptional one and of rare occurrence. In the ordinary state of things when there is no clearing commenced which may be afterwards interrupted, individuals of diverse forms are encountered here and there, often in small number, frequently very poor, and rarely in perfectly analogous states. It is thus very difficult to discriminate amongst them, by simply passing through such tracts on a botanical expedition.

Now observe what I have done at my own place. I take some seeds, either from the same place where the plant which I wish to study grows, or from my garden off plants which I have placed there from a wild state ; and sow each form separately in pots. Afterwards I place the young plants in the earth outside, for study, so that they may attain their full developement in good condition, and thus spread abroad their ripened seeds around them. In the autumn or the following spring I see great numbers of individuals of each form appear, which are thus placed in a state perfectly analogous, and present every aspect of plants truly wild, but well grown, and of which the development is obtained in a manner altogether normal. It then becomes easy to discriminate between these diverse forms. We can then easily perceive which are distinct, and observe either in the detail, or the totality, of the characters, what are their differences.

These useful comparisons I have made very frequently, and am thus enabled to discriminate between a great number of neglected or ignored specific forms. Are you acquainted with many botanists, many authors, creators of species, or sitting in judgment on those which others have established, who have done what I have indicated above, and who have practised

it so often and for so long a time? As for myself I know none, and I do not know that one such can be named. I think I may be permitted, when I encounter such assertions or negations without proof, brought against me, to pay them no attention but to pass on. Sometimes, at the sight of such gross ignorance, which displays itself so pompously in certain books and which says it is, or believes itself to be, wisdom, one can scarcely suppress a feeling of disdain and pity. Still, such a feeling is not good; for it is the duty of a critic to shew himself equally humble as indulgent; he has good need to remember that human infirmity is such, that we have, all of us, more or less, a closed eye upon some corner of truth.

In addressing you thus lengthily upon some important points which are connected both with your studies and my own, my desire is that you should not feel displeased or think me importunate. You will doubtless see in them a mark of the confidence I have in the rectitude of your judgment and the sincerity of your labours. You are not I am sure, one of those whom the truth makes afraid, and who begin by at once turning their backs upon it for fear of meeting it on their route. Invited by me to search after truth on the ground of experiment and fact, I doubt not you will follow up the track, drawing many others after you, to the great advantage of that science which is so dear to you, and the advancement of which is the constant aim of all your efforts.

Lyon, 22nd January, 1866.

NOTES ON THE OAK-LEAVED WOODBINE.

By Henry Waring Kidd.

This seems scarcely to be the variety, *quercifolium*, of *Caprifolium* (*Lonicera*) *Periclymenum*, of Loudon's "Encyclopedia of Plants," as only some of the leaves are indented, so I only consider it an approach to that variety.

In some specimens the likeness to oak, is very striking indeed, but the segments are always rounder than in the leaf of the oak, besides which the oval figure of the woodbine leaf, is never lost.

The oaken leaves I always find in pairs—in long runners, the first pair are generally the most deeply indented, the second pair less so, and soon

finally become of the true woodbine form. I find oaken leaves on the same bushes year after year. A somewhat similar indentation takes place in the leaves of the Snowberry, *Symphoria racemosa*, but the indentations are deeper, and sharper than in the woodbine. A *Legusteria formosa*, in the garden of a friend near Haslemere, had its *lower* leaves deeply cut into Vandykes, while its upper ones were of the proper oval form. I observed this in 1863, and again in 1864—I mention these, as showing that allied plants have similar vagaries; *Legusteria*, is also a genus of *Caprifoliaceæ*. I have met with the oaken leaved woodbine, at Haslemere, and in various places about Godalming, and a nurseryman in this neighbourhood tells me, Godalming is a noted locality for it. I find no notice taken of it in the "Flora of Surrey," and I am told it is almost unknown in some localities.

Godalming, January 26th, 1866.

MATERIALS FOR A FLORA OF WAKEFIELD AND ITS NEIGHBOURHOOD.

By T. W. Gissing.

(Concluded from page 287.)

ADDITIONAL SPECIES AND LOCALITIES.

Ranunculus peltal-floribund. Stanley.

R. lingua. Coxley Mill Dam (Mr. Smith.)

Actæa spicata. Whitley (Mr. Smith.)

Berberis vulgaris. Ledstone (Mr. Roberts,) between Stainton and Tickhill, (Mr. Farrent,) Oulton and Methley, (Mr. Roberts.)

Fumaria confusa. Stanley.

Senebiera coronopus. A garden weed.

Cardamine amara. Darton.

Arabis thaliana: Darton. The early and late forms of this plant vary considerably, the earlier being never much, and sometimes not at all branched and with only a single rosette of leaves spread upon the ground—the later is often more than a foot high, and with many branches and all the root leaves absent.

Viola palustris. The " bottoms" Lofthouse, (Mr. Roberts.)
Stellaria Borœana. Stanley.
Medicago sativa. Monk Fryston, (Mr. Roberts.)
Astragalus glycypyhllos. Burton Salmon, (Mr. Roberts.)
Lilium Martagon. Occasionally in thickets but not wild.
Xanthium spinosum. Near Leeds (Mr. Roberts.)

NOTES ON THE ORNITHOLOGY OF NORFOLK.

By T. E. GUNN.

Varieties.

Blackbird. A well marked piebald variety, an adult male, was killed in the vicinity of Cromer, on the 11th instant.

Missel Thrush. A splendid variety, a male, was obtained on the 24th instant, at Thuxton. The whole of its head and neck was white ; its back, upper wings, and tail-coverts speckled with patches of the same ; under wing coverts pure white. This is the only instance of variation in this species that has passed within my notice during the last seven years.

Partridge. On the 3rd instant, a very pale ash and cream coloured variety was killed at Blickling. This variety of *Perdix cinerea*, has bred for several years past on the Westwick estate ; two or three examples being usually obtained each season in that locality and the surrounding vicinity, and in all probability the above occurrence is one of the same breed,

Red-legged Partridge. On the first day of the shooting season an immature male was killed at Hobbis ; six or seven of the centre feathers of its tail, and the primary feathers of its wings were white, a few feathers of the same hue were also thinly scattered over other parts of its plumage.

Rarities.

Buzzard. A fine male specimen of *Falco buteo*, was shot at Beeston, near Norwich, on the 19th of September. It measured from tip of beak to tip of tail, twenty-one inches ; tip to tip of extended wings, four feet ; wing from carpal joint, fifteen inches ; tail, ten inches ; iris and cere, lemon yellow ; bill, black, pale horn at base ; legs and toes, lemon yellow.

Rough leggedBuzzard. Two fine immature specimens of *Falco lagopus*

have been obtained ; one on the 6th instant, and the second on the 17th; the former was killed a few days previously in the vicinity of Smallburgh, and the latter in Horning Fen. I took the measurements of the second example which are as follows ;—beak to tail (both inclusive), twenty-one and a half inches ; from tip to tip of extended wings, four and a half feet ; wing from carpal joint, seventeen inches ; tail, ten inches ; iris and cere, yellow ; bill, black, pale horn at base ; toes, lemon yellow. Of the two species above mentioned the former is now considered the most rare in Norfolk.

Hen Harrier. I dissected a female on the 14th that had been shot two or three days previously in the vicinity of one of our broads. Its gizzard contained the remains of one of the *Paridæ*, probably *P. cæruleus*, and also the entire leg and foot of a *Scolopax gallinago*, with other remains.

Short Eared Owl. This species seems pretty abundant this season ; their first arrivals commenced during the latter days of September, which is unusually early, compared with their arrivals in previous seasons. The arrival of our migrants is soon made known by the immediate slaughter of a large number of them. I had many opportunities of examining individuals of this species that passed through my hands during the past month, the majority of which proved to be females.

Ring Ouzel. This species arrived in tolerable plenty in this neighbourhood, early in October, and after a few days stay took their departure southwards.

Stonechat. A male was obtained at Brooke, on the 13th of October, it had assumed its winter plumage which differs somewhat from its summer dress, by being of a blacker hue on its upper parts, the feathers margined with paler brown ; its summer dress carries a more rufous tinge over its whole plumage, more particularly the breast.

Mealy Redpole. A small flock of these birds arrived in this neighbourhood late in September last.

Hooded Crow. Arrived in October—examples killed at Wroxham, Haddiscoe, &c.

Spotted Woodpecker. Three adult specimens, two males and one female, have been shot during the past week.

Quail. A female bird of this species was killed at Burgh, near Yarmouth on the 5th of September ; an immature specimen was also shot on the 10th instant, at Cromer.

Purple Heron. An immature bird of this species was purchased in our fishmarket during the latter part of September last.

Norfolk Plover. An example was killed near Norwich, on the 2nd of August; a second individual a mature male was shot in September on the Rackheath estate. The gizzard of the latter contained in addition to its grindstones, the remains of *coleopterous* insects and some fibrous matter.

Turnstone. August 12th, an immature bird on the beach at Cromer.

Pectoral Sandpiper. A fine specimen of this rare species was killed on the 16th of September, at Caistor, near Yarmouth, it was forwarded to Mr. Knight, bird stuffer of this city, for preservation.

Landrail. Four or five examples of the Landrail, *Gallinula crex*, were obtained in this neighbourhood in the early part of October, and one even as late as the 12th, this is I believe unusually late for the departure of this species.

Little Stint. Two examples were killed on the beach at Salthouse, in the beginning of August; on dissection they proved to be male and female, both were exceedingly fat. They measured as follows :—

	Male.	Female.
Beak to tail, (both inclusive).....	$5\frac{3}{4}$ inches	6 inches
Tip to tip of wings .....11$\frac{1}{2}$	„	12 „
Wing from carpal joint.....	$3\frac{3}{4}$ „	4 „
Tail	$1\frac{3}{4}$ „	$1\frac{7}{8}$ „
Bill	$\frac{5}{8}$ „	$\frac{3}{4}$ „

Sclavonian Grebe. An individual was killed on the river near Horning, on the 6th of October. It measured thirteen inches in length from beak to tail; five and three eights inches in the wing, from carpal joint; irides, bright red; legs and feet, horn colour, darker underneath, upper surface tinged with a pale yellow; bill, pale horn colour.

Red Throated Diver. This species arrived in some abundance around our broads and coast during October, as many as eight examples have passed under my notice; the following are the dates and localities of their occurrence :—

Oct. 5. A male killed at the mouth of the river Yare at Yarmouth.

„ 14. A male from Cromer, also one from Hickling broad.

„ 16. Three examples from Cromer.

„ 21. A male, Beeston Regis near Cromer

„ 16. An example, likewise a male, was received from the neighbourhood of Ipswich.

All the above specimens with the exception of one out of the three obtained on the 16th at Cromer (which appeared to be a young bird of the

year)were mature birds, and mostly males, they were in full summer plumage, excepting a few white feathers which had just made their appearance around the base of the bill, and over the red patch of the throat; one example however, the male, that was received from Ipswich, had no indication whatever of this change of plumage. The following is the correct measurement of the first male specimen as mentioned above :—

Total length from beak to tail	28 inches
Wing from carpal joint	12 „
Bill tip to gap	3⅜ „

Iris, dark red; bill, black; assuming a pale horn colour, at the tip of the upper mandible, and towards the base. All the captured individuals that I examined appeared to have subsisted well since their arrival, they were all in good condition, and in some cases exceedingly fat. In dissecting them, I found some of their stomachs filled with the remains of fish, such as scales, bones, &c., intermixed with bits of reed, weed, and their grindstones; one of the latter that I picked out measured just an inch across. I also obtained from one of their stomachs an entire specimen of the roach, it measured five and a half inches in length, the head being crushed, and the fins and tail broken, caused by the bird dashing its victim from side to side previous to swallowing it.

Gannet. An adult pair of this species have been killed in Norfolk during the present season, the female bird on the 3rd of October, on the coast near Sherringham; and the male on the 21st of the same month in the neighbourhood of Yarmouth. I took the measurements of the female, only, which are as follows :

Beak to tail, (both included)	37 inches
Tip to tip of extended wings	6 feet.
Wing carpal joint to tip	19 inches
Bill tip to gap	5⅞ inches
Tail	10½ inches

Iris, silvery grey; primary quill feathers, black; the second, the longest; bill, of a uniform pale horn colour; space around the irides and the base of bill, of a deep bluish black; the two centre feathers of its tail project one and a quarter inches beyond the tips of the others. The outside surface of the shaft of the first primary quill feather, of a deep black; inside, white; the shafts of the remainder, being of a pale tawney outside; white, inside. The bird appeared in rather a meagre condition, its stomach being empty. The male bird was in exellent plumage and condition.

Arctic Tern. A fine immature specimen was killed on our coast on the 31st of October. Its stomach contained the remains of shrimps and some pieces of seaweed intermixed; and also two small white worms which were alive.

Herring Gull. In examining an individual that had been killed on our coast during November. I discovered a small fish hook fastened through its neck just above its shoulders, it had doubtless caught an escaped fish, and in swallowing portions of it had fastened the hook into itself, it had apparently remained in that situation for some time the flesh was closed over and completely covered it; the bird appeared in excellent condition, the unusual appendage seeming no hindrance to it in swallowing its food.

Richardson's Skua. A mature male was killed on Hickling broad. The following are the correct measurements :—

Tip of beak to tip of tail...	18 inches
Tip to tip of extended wings	41 inches
Wing from carpal joint	12½ inches
Tail	8½ inches
Bill (tip to gap)	1⅞ inches

Irides, dark hazel nearly black; legs and feet black; bill the same; the the whole surface of its plumage is of a uniform brown assuming a more paler and smoky tint on its breast and under parts; first primary quill feather dark brown, the next lighter, attaining a slight rufous tinge; the shafts of the feathers are white, as also are those of the tail at the base, gradually inclining to a brown, and attaining a black at the tips; the two centre feathers of its tail project three inches beyond the tips of the remainder. For a description of an immature example of this species, see the *Naturalist*, Vol. I. page 243.

Norwich, November 30th, 1865.

Reviews.

REPORT OF THE LIVERPOOL NATURALISTS' FIELD CLUB, FOR THE YEAR 1864—5

Liverpool: Fearnall 1865.

This very interesting Report contains notices of the Meetings and Excursions during the year, with lists of the prizes and prizeholders, &c.

Its labours seem to be principally botanical; though Conchology and Entomology receive a share of attention.

The following plants, some new to the district, others from new localities, have been added to the Liverpool Flora during the year :—

Primula caulescens. At Speke, Miss C. Grundy.
Serratula tinctoria. Speke, Mr. T. Gibson, Sen.
Silene noctiflora. Crosby, Mrs. T. Gibson, Jun.
Linaria peloria. Seaforth, Mr. T. Gibson, Sen.
Ranunculus hirsutus. Ditton and Claughton, Do.
Potamogeton rufescens. Warrington, Do.
Anchusa sempervirens. Allerton, Do.
Geranium pusillum. Litherland, Aintree, Do.
Geranium pusillum. New Brighton, Miss C. Grundy.
Reseda fruticulosa. Waterloo, Mrs. T. Gibson, Jun.
Hordeum pratense. Waterloo, Mr. H. S. Fisher.
Poa compressa. Parkfield, Mr. H. S. Fisher.

Rosa Jundzilliana, Bess., was discovered by Mr. Fisher and Mr. Webb, at Moreton in Cheshire.

On the ballast at Birkenhead, Messrs. Gibson, Sen., and Fisher, have found *Mercurialis annua*, *Lepidium ruderale*, *Ammi majus*, and *Ranunculus Pennsylvanicum.*

On the 24th January, a Soirée was held at which many interesting objects were exhibited, amongst which was a case of "four hundred bottles of seeds of British wild plants mostly gathered in the neighbourhood" by Mr. Gibson. We would strongly recommend all botanical students to make similar collections as they are extremely interesting and useful. At one of the meetings Mr. Pyzer shewed some ferns grown from spores sent by Samuel Archer, Esq., H. M. 98th Regiment, from Cashmere, which were identical with British species, viz. :—*Asplenium fontanum*, from very ancient ruins between Coree and Nowshaira on the Murree route to Cashmere; *Asplenium Trichomanes*, from Coree, *Ceterach officinarum*, near Chicotee.

A number of prizes according to the usual custom are offered during the following year, amongst which are, for ladies only, one for the collection and arrangement of the largest number of plants in flower.

One for the largest number of plants in flower of a given order.

One for the greatest number of plants.

One for the largest number of species of larva of Lepidoptera &c.

The "Session Prizes" are seven botanical, fourteen zoological, two geo-

logical, two microscopical (Foraminiferæ and Diatomaceæ) and some other prizes offered by private individuals.

Among the botanical are the Presidents' prize of £1 1s. for the best series of botanical preparations exhibiting the distinctive character of all or some of twenty-four natural orders of which the names are given, the preparations to be made from one species only of each order; also general prizes of £1 1s. each, for the best general herbarium of one of the great divisions of the vegetable kingdom. The same plan is followed in the animal kingdom. These prizes are all to be given in books.

One species of prizes hitherto given, we think scarcely wise, viz. : those given for the collection of the greatest number of "rare plants"; will not such a prize have a great tendency to eradicate some of the rarer species from the locality. There could be no objection to this prize if it be merely for the *discovery* of such rare plant, but in very few cases, if ever, ought it to be gathered. In every other instance we think the example set by the Liverpool Club, might with great benefit be followed by all others.

The balance sheet of this Club which is included in the "Report" along with a list of members, shows it to be in a very flourishing condition and one which we doubt not many others will envy. There are seven hundred and two members, an increase of seventy on the previous year, and there is a balance of £50 in the Bank.

OSWESTRY AND WELSHPOOL NATURALISTS' FIELD CLUB, AND ARCHÆOLOGICAL SOCIETY.

Reports of Meetings (with Papers read,) *during the years* 1857—64. Oswestry : Roberts, 1865.

This Club has evidently done good work in the district in which it is situated during the nine years of its existence. The evening meetings and excursions appear to have been well attended, and the papers read, of varied interest. It would be impossible for us to notice all these, but there are some among them which require more than a passing notice, and in selecting a few of these we would deprecate any appearance of being invidious, or any idea that those passed over in silence are without interest. One of the

earlier papers on the " Geology of the District" by the then Secretary, shews that it would be difficult to find another district of equal extent where the Geological student would be able to examine such an extensive range of stratified aqueous deposits, which include nearly all the members of the Palæozoic system, from the Llandeilo to the Permian, also the base of the Mesozoic—the Trias, which in some places is overlaid by the older members of the Oolitic series. Mr. D. C. Davis, an indefatigable geologist, has contributed several papers, amongst which is one on the discovery of fossils in the Millstone Grit,a series of beds generally deemed unfossilliferous and certainly not without some little truth. However, Mr. Davis records the finding of a specimen of *Sanguinolites variabilis* in two localities,one on Sweeney Hill, near Oswestry, by Mr. Meredith, and another by himself and Mr. A. Norris, in a dark sandstone near Treflach Hall in March 1860. *Rhynchonellæ* have been found in the cutting of the Oswestry and Newtown Railway, near the former place in 1859, and *Petraia* and *Orthis*, near Llanfordaisaf ; fragments of *Encrinites* and *Trilobites* are also mentioned, but we certainly look with great suspicion upon them and should suggest further research as to whether these beds are really Millstone Grit. Have they not been found in some portion of what Mr. Davis calls the " middle grey beds" of the mountain limestone in another paper (p. 51.) which in their upper portion pass into an " impure sandy limestone" near Llanymynech ?

At most of the excursions a number of local botanists were present, and one or two papers are devoted to that science. Several plants not common are noted in the locality amongst which we may mention *Cladium Mariscus,Osmunda regalis, Neottia nidus-avis, Chlora perfoliata*, but no very great rarities are recorded. May we suggest to the Club the propriety of publishing a Fauna and Flora of the district. We are certainly somewhat surprised to see several old names attached to some species, as *Cistus Helianthemum, Fumaria claviculata, Cistus marifolius, Mespilus Cotoneaster*, &c. We should be glad to see an annual instead of septennial report of the Society's proceedings in future.

Zoology appears not to occupy a very prominent position in the Society's labours—one paper only by Mr. R. G. Jebb, on " Ornithology" having been contributed. This paper which was read at the " Conversazione" on the 30th December 1864, gives a short sketch of the science, followed by a notice of some of the birds found in the district and their habits.

News.

A turtle was washed ashore on the beach near Gorran, Cornwall, last week. When found it was crawling up the beach towards land. Some boys at Trevesson Farm, pulled off its head with a crab-hook, and killed it. Its weight was about twenty-eight pounds.—*Reading Mercury.*

Observations.

A very fine specimen of the eared seal (*Otaria*), has just been added to the collection of the Zoological Society, Regent's Park. This animal was captured by a sailor serving on board a French ship while off Cape Horn, who after some trouble and a few bites from his strange pupil has succeeded in rendering it so docile that it readily obeys its captor, following him about, performing various feats and apparently bears, if the expression may be used, some amount of affection towards its keeper, though to strangers its bearing is not altogether friendly. Some little interest attaches to this addition to the Society's menagerie inasmuch as it is the first time an eared seal has ever been seen alive in the Society's gardens or indeed in Europe before.

Reports of Societies.

The Queckett Microscopical Club.—The ordinary monthly meeting was held on Friday, 26th January, at 32, Sackville-street, Piccadilly, P. Le Neve Foster, Esq., V.P. in the chair. Mr. Suffolk delivered an introductory address on the microscope, preparatory to the establishment of Elementary Classes for beginners in microscopic study. Mr. Archer also read a paper on the respiratory organs of Insects. There was a large attendance of members and their friends. Eleven gentlemen were elected and eleven proposed for membership. A conversazione terminated the evening, many very interesting objects being exhibited.

The Amateur Botanists' Society.—At the meeting of the above Society held in London, February 7th, 1866, the President in the chair, some leaves of *Hedera conariencis* were exhibited by the secretary, to show how very nearly related it is to *H. Helix.* Two papers by Mr. Robinson, of Frodsham were obliged to be left over till the next meeting, as it had been resolved to devote a part of the evening to the examination of Vegetable Tissues with the microscope, and the President, also Messrs. Bywater, Ruffles, and Reeves, very kindly brought their instruments with some beautiful preparations for the purpose. The next meeting will be held on Wednesday, the 7th of March.

Exchange.

I have saved a large quantity of seeds of *Glaucium phœnicewm*, and will send a packet to any one requiring it, on receipt of three postage stamps. The proceeds to be applied in aid of the Building fund for New Schools. I have also a few dried specimens of the plant, which I offer in exchange for examples of rare British plants. Address: Rev. W. M. Hind., The Parsonage, Pinner, Watford.

I have pupæ of *C. elpenor*, *N. dictæa*, *N. ziczac*, *P. palpina*, *C. vinula*, *C. bifida*, *C. furcula*, &c,. which I should be glad to exchange for pupæ of any of the following *A. atropos*, *S. porcellus*, *S. fuciformis*, *S. bombiliformis*, *N. Carmelita*, *E. versicolor*, and *C. bidens.*—W. E, Parsons, California, Aylesbury.

Original Articles.

NOTES ON BIRDS COLLECTED BY E. M. YOUNG, ESQ.,

In the vicinity of the Nile and in Palestine.

By R. B. Sharpe.

The birds which form the subject of the present paper, were collected by Mr. Young, during his trip to the East, in the winter of 1863 and the early part of 1864, and he has kindly allowed me to describe them. Although the list does not contain many birds, and few rarities, I feel great pleasure in presenting to the readers of the *Naturalist*, a description which may enable them to distinguish the species, should they at any time meet with any of them. In preparing this description, I have referred to the Rev. H. B. Tristram's paper on the Birds of Palestine, (Proc. Z. S. 1864.) Bonaparte's Conspectus and other works. Mr. Gould's works on the Birds of Europe and Asia, have also been of the utmost service in helping me to distinguish the species, and Mr. Young has supplied me with many valuable notes, which I think, cannot fail to make the paper most interesting. It will be noticed that a few of the birds are met with in the British Islands, but none of them can be considered as common. *Falco Æsalon*, Gm., and *Upupa epops*, Lin., are both occasional visitants, and of the other *Sylvia tithys*, Scop., and *Lanius Collurio*, Boie., are sometimes, though not often observed. As collecting specimens did not form the object of Mr. Young's visit, the variety of species obtained was not great, but in most cases, a pair, and sometimes more of each bird was shot ; and the skins, though slightly crushed in their transmission to England, were well preserved, and I was easily enabled to identify them.

1. Buteo augur, *Rüpp.*—North African Buzzard.

Falco augur, Rüpp.

Falco hydrophilus, Rüpp.

It was some time before I could determine this species, but I found a specimen in the British Museum. I thought it might be *B. rufinus*, Rüpp, but on comparing the specimen with that in the British Museum, I have discovered it to be *Buteo augur*. These birds may generally be seen in Egypt, wheeling above the abodes of man, more often out of shot than within it. Egypt is peculiarly the home of Rapaces of many kinds.—A recent murrain among the buffaloes had strewn the banks of the Nile in 1863

with dead carcases, and as birds and dogs are the only scavengers of the East, not a day passes but the travellers might have shot more Buzzards and Vultures than they could, or would, have preserved.

2. Elanus Melanopterus, *Daud.*—Black Winged Falcon.

Elanus cæsius, Sav.

Buteo vociferus, Vieill.

Two specimens of this pretty Falcon are in Mr. Young's collection. They are chiefly remarkable for the beauty of the eye, which is large and of a deep crimson, and for their length of wing, which clearly marks them as a bird of strong and active flight. The predominating shade of the plumage is bluish grey, which contrasts strikingly with the black of the wing. Their food is said to consist for the most part of insects. Both specimens were shot in the neighbourhood of Beni-soueyf, about seventy miles from Cairo. They do not seem to frequent the Nile except in Lower Egypt.

3. Falco æsalon, *Gm.*—Merlin.

Æsalon lithofalco, Kaup.

Hypotriorchis lithofalco, Gray.

This is one of our British species, although the bird in Mr. Young's collection seems of a darker hue, than any I have seen killed in England. Mr. Tristram says, that in Palestine, it was apparently only a winter visitant, not being observed after March. I suppose the plumage is lighter in the summer, when it visits our shores. The present specimen was shot among the palm groves of Nubia, where hawks and owls are very plentiful.

4. Tinnunculus alaudarius, *Briss.*—Kestrel.

Falco tinnunculus, Linn.

Falco brunnæus, Beckst.

Mr. Tristram, says, this bird is common everywhere in Palestine, excepting in the southern wilderness, and a constant resident. The Kestrel is familiar to all who have taken any interest in British Ornithology and therefore no comments are needed.

5. Upupa epops. *Linn.*—Hoopoe.

Upupa vulgaris, Pall.

Upupa macroryncha, Sand.

The bird was noticed in Palestine by Mr. Tristram, who says it returns there about the end of March. Mr. Young procured a very fine pair, the male especially being beautifully preserved. The latter may be known by

the darker shade of the colouring; it is one of the commonest of Egyptian birds. Mr. Young shot seven in an hour upon the same heap of rubbish. It may always be found in and about the wretched mud villages, where it is attracted by the filth and putrefaction which are inseparable from Egyptian life. It was frequently observed in Palestine, but was less common there than in Egypt.

6 Ceryle rudis, *Linn.*—Black and White Kingfisher.

Alcedo rudis, Linn.

Ceryle varia, Strickl.

This bird is very common both in Lower and Upper Egypt, remaining throughout the year, and breeding about April 1. It is curious to see how tenaciously it would keep to a particular perch, generally a dry stick or a telegraph wire, if such were at hand. When in search of food, it might frequently be seen poised in the air over stagnant pools, till it suddenly dropped on some fish, diving completely beneath the surface. The fluttering of its wings, as it thus poised itself, was extremely pretty. The note is a shrill twitter, not often heard. The colour of the eggs is white. Mr. Young says he has often pursued this bird for more than a mile along the river bank, as it flew in front of him, continually perching, but never allowing him to get within shot, till at last, seemingly tired of the chase, it would fall an easy prey to the gun.

7 Merops viridis, *Linn.*—Green Bee-eater.

Merops citrinella, Viell.

Merops ferruginiceps, Hodgs.

The constant presence of this little bird is one of those charms, which make the tourist forget the monotony of Nile's mud-banks; Acacia trees, (*Arab* : 'Sont.') and cotton thickets are full of them, and whenever a gleam of sun entices them from their hiding places, they may be seen dancing up and down in it, as if to show off to the best advantage their glossy green wings, and tapering tail feathers. They may occasionally be seen perched in rows of four or five upon the telegraph wires, which generally form part of an Egyptian scene. As many as four or five fell on one occasion at one discharge of dust shot. It is among the commonest of Egyptian species. Like the flycatcher it hunts from a fixed spot, seizing its prey on the wing, and then slowly returning to its former position. On approaching the Upper Nile, they became rarer; the last seen was at Assouan. In Nubia there were none. The larger bee-eater was seen and heard constantly in Palestine, but the smaller species were never found again after leaving Egypt.

8. Otocorys penicillata, *Gould.*—Pencilled Lark.

Otocorys scriba, B.P.

Alauda penicillata, Gould.

Not a very common bird. It is chiefly remarkable for a horn on each side of the head, which is erected perpendicularly when approached. They fly in companies of from three to twelve birds, and are tame and familiar in their nature. The present specimens were shot in the snow drifts of Hermon in June, a nest was found with young ones hatched. It is I believe very common in Persia, (See Mr. Tristram's 'Land of Israel,' where he calls it the Persian lark.) It is found in numbers in the highest regions of Lebanon and Anti-Lebanon.

9. Ruticilla tithys, *Scop.*—Blackstart.

Motacilla tithys, Linn.

Ruticilla erythœa, B.P.

Mr. Young has given me the following note concerning this rare species. "This little bird was not easily obtained; I shot it among the cedars of Lebanon, where its peculiarly shrill note attracted my attention. I had not seen it previously in Syria, but there seemed to be several among the cedar trees. Its cunning in keeping close to the thickest boughs, and dodging me round them as often as I caught sight of its red breast, for a moment was quite provoking. After a chase of about two hours, I was fortunate enough to secure the present specimen, not without a long hunt, for falling from a lofty branch, it was caught and hidden by a fork in the tree, and I had almost given up the search as vain. Mr. Tristram shot the bird, I believe in the same neighbourhood." It is also known by the name of the Black Redstart and has occasionally been met with in this country though of very rare occurrence.

10. Saxicola leucomela, *Gould.*—Black and White Stonechat.

Motacilla leucomela, Pall.

This pretty little bird (often confounded with *S. capistrata*,) is remarkable for its delicate form, and the strongly marked contrast of the plumage. Mr. Young says it was common in Nubia where he usually found it in pairs, He further adds, "the nest of this bird I could never obtain, although I frequently felt sure I was close to it. It builds in the holes of the Nubian rocks, and may often be observed upon a spray or crag by the river bank. I also found the bird in the Sinaitic desert among the wadies west of the peninsula, but it was not common.

11. Lanius collurio, *Linn.*—Redbacked Shrike.

Enneoctonus collurio, Klein.

Enneoctonus spinitorques, Klein.

I was much struck with the great difference in size, that was so apparent between the English species, and that shot by Mr. Young. The male in my own collection is much larger, and the reddish colour is not so preponderating in the British, as in the foreign specimen. It is a very common bird in Syria, in the lower regions of which country the present specimen was shot.

12. Hirundo Savigne, *Leach.*—Oriental chimney swallow.

Cecrops Savigni, Boie.

Hirundo rustica orientalis, Schl.

This bird is similar to *H. rustica*, with this exception, that the parts which in our familiar species are white, are in the above bird, of a bright reddish colour. It is seldom found in Europe, though Mr. Young found it abundant in Lower Egypt, on his return from Nubia in February.

Cinnyris osea, *B.P.*—Sunbird.

Nectarinea osea, B.P.

This is a great rarity, and was fully described by Mr. Tristram in the "Ibis" 1865, where a very beautiful plate will be found. Mr. Young says, "I shot several specimens in the thickets of Ain es Sultan, Jericho, where they were seen in numbers sucking honey out of the flowers. The female is an unpretending little bird of brown plumage, Mr. Tristram found occasional specimens both north and south of Jericho, but their home seems to be in the neighbourhood of Elisha's spring." Until brought into notice by Mr. Tristram, the species was represented by a single specimen in Antinori's collection, though previously described by some authors as a Humming-bird.

14. Emberiza melanocephala, *Scop.*—Blackheaded Bunting.

Xanthormus caucasicus, Pall.

Euspiza melanocephala, Bp.

This bird is very common; it is one of the sweetest songsters of Syria; it might very well be taken for a canary, if its song were a little more prolonged, but it is provokingly "short and sweet." It somewhat resembles our *E. citrinella*, in its habits. It was curious to see how pertinaciously this bird always chose the topmost twig of a bush for its perch. It was never satisfied with an inferior position. A distinction must be drawn between this species, and *E. schœniclus*, which is sometimes known as the Blackheaded bunting, but for which the name of Reedbunting is more appropriate.

15. TURTUR CAMBAIENSIS, *Bp.*—Cambaian turtle.

Columba cambaiensis, Gm.

Columba erurgalensis, Linn.

This is an elegant little bird, rather smaller than our own *C. turtur*. It is found in almost every tree, sont and sycamore throughout Egypt and Nubia. Indeed the constant cooing of doves mingling with the murmuring of water wheels (sakia) is almost the only real music met with in this unmusical land.

16. PLUVIANUS MELANOCEPHALUS, *Vieill.*—Zic-zac.

Charadrius melanocephalus, Linn.

Charadrius ægyptus, Gould.

Sesson says, this bird is found in Senegal, and I have gathered a few facts from Gould's Birds of Asia respecting its habits. It is called in common with *H. spinosus*, the Zic-zac from its note, and it is a matter of some doubt whether this latter bird or *P. melanocephalus*, is the *brochilus*, which according to Herodotus, picks the Crocodile's teeth. Gould seems to think this is the species, as, in his plate of *P. melanocephalus*, he represents the bird as performing the kindly office for the ungainly monster. Mr. Young's note contains a curious fact in relation to this bird, and records an instance of its surprising vitality. He says that, having shot a specimen through the head, he picked it up, staunched the blood, and put it in his pocket. Walking further on, he was surprised to see a *trochilus* get up close to him and fly across the Nile, uttering its peculiar note. On feeling in his pocket shortly after, he found the apparently dead bird had come to life, spread its delicate wings once more, and landed safely half a mile or more across the river.

17. HOPLOPTERUS SPINOSUS, *Bp.*—The Spurwinged plover.

Very common in Egypt. The natives call it the zic-zac in imitation of its cry. The present specimens were obtained at Thebes. Gould (B. of Europe) says these birds are very noisy in their habits, and the the sexes are so closely allied as to shew no perceptible difference. Nothing is known of its nidification.

18. HERODIAS GARZETTA, *Linn.*—Little Egret.

Ardea garzetta, Linn.

Ardea nivea, Gm.

Latham says it is called in Egypt, the "Ox-Keeper" (more properly Buffalo-bird, all the oxen of Egypt being Buffalos,) from its habits of frequenting the backs of cattle, and feeding on the larva of *Astrus* which

infest them. Its food consists of reptiles, insects, &c. Mr. Tristram says it was found in the marshes near Jaffa, in considerable numbers. Mr. Young says, it is commonly called in Egypt "the Ibis," which is a totally different bird. The Egret is remarkably tame, and if one of a flock were shot, it generally happened that the whole flock persisted in flying over my head, or wheeling round and round as if to invite the fate of their comrade. I have not unfrequently seen a pair of egrets on one buffalo's back."

19. Ardea russata, *Waigl.*—Rufous-backed Egret.

Ardeola russata, Temm.

Ardeola bicolor, Vieill.

An interesting fact connected with this species is, that it was once shot in England, in the year 1805, near Kingsbridge, Devon. Of its habits and manners we have no certain account, but its food is said to consist of small fish, frogs and various insects.

20. Totanus hypoleucos, *Temm.*—Common Sandpiper.

Actitis hypoleucos, Macgill

Fringa hypoleucos, Linn.

Called by the natives "Beccasine." "Doves and Beccasines" were the most delicate dish to be met with on the Nile.

20, *Harwood Terrace, King's Road, Fulham, S.W.*

ON A FEW OF THE LOCAL FLOWERS OF HIGH WYCOMBE.

By Jas. Britten.

The following Paper was read at the Meeting of the High Wycombe Natural History Society, on 22nd January, 1866 :—

"Having been requested by the Secretary to read a paper this evening, I have put together a few notes on one or two of the rarer flowers to be found in our woods round Wycombe. Our locality is upon the whole a favoured one for botanical treasures, and has not been so thoroughly worked as many other parts of England. The total number of British species of flowering plants is upwards of 1500 ; of these we have within a radius of five miles certainly 700 ; probably further search will discover more. The four plants to which I shall direct your attention are the Coral-root, the

Mezereon, the Lily of the Valley, and the Snowdrop,—species which I have selected because three at least of them are pretty generally known, and because they are especially interesting on account of their beauty or rarity. The Coral-root (*Dentaria bulbifera*) is one of the rarer plants of this country, being found in but few of the English counties, and in but one Scottish locality, in the county of Ayr. It is a very elegant species, growing usually in patches in woods, and blossoming at the end of April and beginning of May. Though a tall plant, and having bright coloured blossoms, it is extremely liable to be overlooked, except in the flowering season, as the stems and leaves soon wither, and the latter, in a young state, bear considerable resemblance to those of the Gout-weed, (*Ægopodium podagraria*). The method in which the Coral-rool is propagated is somewhat remarkable: its elegant flowers seldom, if ever, produce seed; nor is this necessary, for in the axils of the leaves are small buds or bulbs, which are described by Parkinson (an exhaustive writer of the 17th century) as being 'of a sad purplish greene colour, which being ripe and put into the ground will grow to be a roote, and bear leaves like as the bulbes of a red bulbed lillie.' These bulbs easily drop off, and are with difficulty retained upon dried specimens; to them the plant owes its specific name *bulbifera*, or bulb-bearing. The flowers are of a delicate purplish lilac colour, which, however, fades away when they are dried; their shape at once places them in the order of cross-shaped flowers, or Cruciferæ, and they have a faint, sweet scent. Both the English name Coral-root, and the Latin *Dentaria*, or Tooth-wort, are derived from the curious appearance presented by the root, which is long, thick, brittle, and very white, running along horizontally at a short distance beneath the surface of the ground, and somewhat resembling branches of white coral; it is covered with large white scales, which are supposed to resemble teeth: when the root is dried, however, it shrivels up, and these peculiarities are no longer observable. In the olden times, Coral-root, like every other plant, had its "vertues." Parkinson says that 'a dram of the powder of the roote taken for many days together in red wine is exceeding good for inward wounds that are made in the breast and lungs,' and it is also 'very beneficial to be drunke in the distilled water of the herbe called horsetail.' This author appears to have first discovered the *Dentaria* to be a British plant, for in his '*Theatrum Botanicum*,' a quarto work of about 2,000 pages he mentions it as having been found 'at Mayfield, in Sussex, in a wood called Highreede, and in another wood called Foxholes, both of them belonging to Mr. Stephen Perkhurst at the writing hereof.' He gives an

illustration of it, which exhibits many features of interest. Ray, in his 'Synopsis, takes no notice of it, nor does Dillenius ; his subsequent editor Blackstone, in 1737, records it as growing abundantly in the Old Park Wood, at Harefield, Middlesex, a locality in which it may still be found ; and in 1801, Turner, in his 'Botanist's Guide,' mentioned it, on the authority of Mr. Gotobed, from the woods at Loudwater, between Beaconsfield and High Wycombe, a locality in which it still abounds. I have seen a specimen gathered in Dane Garden or Burland's Wood, in 1852, and here it was observed by the members of this society on their first ramble in the past year. I have also seen it in the Winch Bottom, Oakridge, Booker, West Wycombe, Bradenham, and Kingshill Woods, as well as in Wycombe Park, among the trees which border the river; and the Rev. Bryant Burgess informs me that it occurs at Latimers, near Chesham. Besides the counties already mentioned, Kent, and perhaps Surrey, produce this very local species. Another of the most interesting plants which our county produces is the Mezereon *(Daphne Mezereum,)* known almost to everyone in a cultivated state, but comparatively unrecognized as a wild flower. Its bright pink or white blossoms, clothing the small but rugged branches before the leaves venture forth, adorn nearly every cottage garden, and appearing, as they do, at the present season of the year, when even the humblest flower seems a treasure, it is, of course, proportionately valued.

'Though leafless, well-attired and thick beset,
With blushing wreaths, investing every spray.'

Although it has been observed in a greater number of counties than the Coral-root, it is perhaps really a rarer plant, inasmuch as one rarely finds more than two or three specimens in one spot. So popular a shrub is of course liable to extermination, from the fact that it is a cottage garden favourite; and in many cases the cottagers inform the enquirer that their 'Mezelion,' or 'Mazalum' trees were brought by their children out of the woods. Some botanists, and among them Mr. Watson, consider the Mezereum as introduced into the woods where it is found, by the agency of birds, an agency which is by some made to account for a great many facts which run contrary to their theories. Professor Babington, however, admits it as an unquestioned native. One person, living near Wycombe, who has in her garden a very fine Mezereum tree, assures me that she believes the birds brought it over from the woods, so that the poor birds seem doomed to be responsible in one way or another. Be that as it may, no one who has taken the trouble to observe for himself, can doubt that Mezereum was formerly

pretty plentiful in our woods, where, indeed, Professor Martyn found it to grow 'commonly,' when he was Vicar of Little Marlow, at the end of the last century. Cottagers and gamekeepers have, however, greatly thinned its growth, and anyone who would find it must indeed seek diligently. It would occupy to much of your time were I to enlarge upon my own attempts at its rediscovery ; I may, however, mention that I first undertook the search in January, 1864, and never was anything so like looking for 'a needle in a bottle of hay' as the hunting for that plant, then presumably in a budding stage, among dozens of tiny elms, ashes, &c., all of which really looked at first sight promising. In the following May, two botanists came from London to search for the plant, and to my astonishment, and I must add, envy, found it both in Fennell's and Dane Garden Woods. A week after, I had an opportunity of following in their steps, but again without success. I will not deny that strong doubts crossed my mind as to the genuineness of the rediscovery ; we are, I fear, naturally disposed to depreciate the success of efforts which we ourselves have made in vain. And so the time passed on, and 1865 came, and I hunted again and again unsuccessfully, while, by way of adding insult to injury, new enquiries elicited accounts of new localities. Thus, a woman gathering sticks had seen it 'O yes, she had seen it, and it grew about *so* high from the ground' ('*so* high' being about 7 feet), leading me to infer that her willingness to please was greater than her adherence to truth. It grew near Amersham, it grew in the Bradenham woods, it grew on Naphill Common, it grew at Kingshill, it grew in Winch Bottom ; it in fact, seemed quite ubiquitous, with the slight difference of not being visible anywhere. There seemed a spell against my ever seeing Daphne in her native haunts, until, on a fine spring day, the 12th of last April, a last search was undertaken in Dane Garden Wood, and, to my great delight, was crowned with success ; for in one part of the wood, obscure and unfrequented, were two or three fine Mezereon trees, about two feet high ! I need scarcely add that I went home very considerably elated, feeling that my perseverance had been well rewarded. Perhaps it may seem to some that the discovery was hardly worth the trouble expended upon it, but the true naturalist will, I am sure, sympathise with my delight at my ultimate success. I have since noticed a fine plant in berry, in the wood opposite the Union House Saunderton just above Avering Down Farm. The berries of the Mezereon are highly poisonous both to man and animals, although the robin and other birds devour them without detriment. The bark, also, is very acrid, and a piece of it in a fresh state laid upon the skin

will raise a blister. In other climates, however, this acridity diminishes, and in Siberia the berries are given to children as a remedy for hooping-cough. The advocates of total abstinence must look on Mezereon as one of their allies, for quaint old Gerarde tell us that 'if a drunkard do eat one graine or berry of this plant, hee cannot be allured to drinke any drinke at that time; such will be the heat of his mouth, and choking in the throat.' The leaves are of a delicate green, and appear after the flowers at the top of the stem; they soon, however, drop off, leaving the bright scarlet berries alone on the stalks, presenting an appearance more brilliant than the flowers which preceded them. Many species of *Daphne* are cultivated in our gardens and greenhouses: *D. odorata*, with exquisitely scented blossoms, which grow to a large size in Devonshire: *D. pontica and D. Cneorum* are perhaps the most generally known; the latter, an elegant species with trailing stems, is reported to have been found at the foot of Snowdon, but some error is to be suspected, as no one but its supposed discoverer has ever seen it there. *D. Laureola*, however, is an undoubted British plant, and may be found sparingly in most of the woods in this neighbourhood. In cultivation, as in the Park, it attains a large size; the blossoms are pale green, with yellow stamens, and fragrant; the leaves, unlike those of *D. Mezereum*, are persistent, that is, do not drop off at the approach of winter; the berries, when ripe, are black. Its flowers expand in January and February. It is known by the names of Wood Laurel and Spurge Laurel. The celebrated vegetable lace of Jamaica is the produce of a shrub nearly allied to the Mezereon, the *Lagetta lintearia*. The inner bark is formed of as many as 20 or 30 laminæ or layers of a substance of a very fine gauzy texture, of which caps and other articles of clothing have been made. The Lily of the Valley (*Convallaria majalis*) is of course too familiar to us to need any description. It is found sparingly in a wild state in most of the English and Scottish counties, and though a favourite border flower, is undoubtedly a native. The bright scarlet berries which succeed the blossoms are not so generally known. The root is considered good to apply to bruises, while that of a near ally, the Solomon's Seal, 'taketh away in one night, or two at the most, any bruise, blacke or blew spots gotten by falls of women's wilfulnesse, in stumbling upon their hasty husbands' fists.' The specimen exhibited was gathered last May, in a wood near West Wycombe, where it grows in some plenty: it is also reported from woods near Booker and Hughenden, but I have searched the latter neighbourhood in vain. In some parts of Lincolnshire, where this Lily is plentiful, annual excursions called 'Lilying parties'

are made to the woods. My last illustration, the Snowdrop (*Galanthus nivalis*) called also Fair Maid of February, is a doubtful native of this country, being usually found in orchards, or in meadows near houses. It is not very uncommon in these situations, though by no means frequent in the Wycombe district. Last Spring, however, a friend informed me that wild Snowdrops grew at Knotty Green, to which place I went on the 2nd of March, a cold, bleak, gusty day, and found it in the greatest abundance on a bank adjoining an orchard, where it was at any rate, thoroughly naturalised. It also occurs sparingly in meadows near Bradenham."

The paper was illustrated by coloured plates and also by dried specimens: the Mezereon was shown in flower. A discussion then ensued on the question of native and naturalised species, and further information was elicited as to localities.

MORE NOTES ON THE OAK-LEAVED WOODBINE.

By James Britten.

As a supplement to Mr. Kidd's remarks on this plant * may I make one or two extracts and observations with reference to its past and present history? Gerarde and Parkinson do not appear to have known of its existence; and it was first brought into notice by Merrett, who in his *Pinax* (1667) p. 92, mentions it, under the name of *Periclymenum fol. quercinis*, as having been found by Mr. Jenner not far from Oxford, this locality is quoted in Dillenius' edition of Ray's *Synopsis*, and a second is added on the authority of Mr. Knowlton—"on the way from Hitchen to Wembly". Here it is named *Caprifolium non perfoliatum foliis sinuosus.* Blackstone in his list of Harefield plants, recorded it under the same name as occurring in White Heath wood near Harefield, plentifully. In the 4th Edition of Withering's "Arrangement" (1801), vol. ii. p. 243, the Oak-leaved Woodbine is mentioned as "Var. 2, Leaves indented" of the Common Honeysuckle, and the locality of "Sir J. Woodhouse's Woods, Norfolk," affixed on the authority of Mr. Woodward. From an article on the subject in vol. vi. of the new series of *Phytologist*, p. 317, it appears that Baxter recorded it from the counties of Oxon, Berks, Warwick, and Norfolk. In the *Flora Hertfordiensis*, (1849) p. 132, it is stated to occur

* "Naturalist," Vol. ii. 293—4.

" not uncommonly in newly cut woods, probably a mere accidental variation, produced by cutting strong plants down to the ground." In the *Phytologist* as previously quoted, Mr. F. Walker writes of a honeysuckle at Southgate which, growing at the root of an Oak, exhibited a great many sinuate leaves, and he seems to infer that this is in someway owing to the influence of its neighbour, a supposition which is not borne out by facts. The variety is not, I think, really a constant one. I have gathered on Wimbledon Common, Surrey, a branch of Honeysuckle bearing both sinuate leaves, and those with the ordinary unbroken margin; and suspect that a careful observer would find specimens partaking more or less of this peculiarity in most districts. The corresponding variation in the Snowberry is very common; but I have never observed it in *Leycesteria* (not *Legusteria*) *formosa*. The Oak-leaved Woodbine is frequently mentioned in horticultural works, and in catalogues of shrubs, &c.

High Wycombe, February 22nd, 1866.

Observations.

Affection in a Dog.—When the mother of the present Robert Burton, Esq., of Fallgates, Linton-on-Ouse, died, they were in possession of a setter dog. This was not present at the funeral, but for seven years after, every night he was in the habit of going to the churchyard, a distance of two and a half miles from the house, to mourn at the grave. The affectionate beast went to mourn its loss as long as he was able to scramble over the wall.—JOHN RANSON, York.

An Early Hare.—A young hare was killed by accident on the Farnley Tyas Estate on the 21st instant: it was about a month old, and in very good condition.—G. WILSON, Thurstonland.

A Happy Family of Cats.—Not a hundred miles from Thurstonland might have been seen a few weeks ago a kitten sucking its mother, and said mother sucking the kitten's grandmother at the same time.—G. WILSON, Thurstonland.

Variety of the common Mouse (Mus musculus).—Last week I caught a singular variety of the common mouse. It was considerably larger than two others caught at the same time, and also different in having the under surface, forelegs, and front part of the head perfectly white. Upon each side were two patches of greyish white. As several of the inhabitants of this island have assured me that "ill luck" invariably follows the capture of a piebald mouse, I presume that other examples have occurred. —HENRY L. SAXBY, Baltasound, Shetland, February, 7th, 1866.

Destructiveness of the Blackbird.—In an old paper which fell into my hands a few days ago, I read a letter purporting to be written by a blackbird to the owner of a garden. The bird pleads innocence to the charge of pilfering cherries, and suggests that a change of gardeners would remedy the evil. Any person writing such nonsense ought to have a well-laden cherry-tree, and encourage these innocents. Now,

Sir, I have two cherry-trees, which are trees of note ; for age, fruitfulness, and the richness of the fruit. In a morning, before break of day, and every minute from that time to dusk, are these feathered thieves at work. They strip the fruit from the stone, leaving it hung; or they fly away with whole bunches to devour at leisure. In this work of destruction they are aided by the robin, most of our summer visitants, and the jay. He that has a cherry-tree in a country garden has got his work to keep the birds off. Rasps are also a favourite fruit of the blackbird, and ripe gooseberries he cannot resist. The quantity of gooseberries these pilferers destroy is very great. I have seen trees, upon which every berry had the contents taken out, and the skins left hanging on the trees, and in a large berry garden if not well watched, they destroy pecks of fruit by pecking it and leaving it thus disfigured and unfit for market. I speak from experience, having suffered great loss at times by them.—J. RANSON, York.

Within the last few days a very fine collection of birds and insects has been received from Mr. Edward Bartlett, now engaged in exploring the river Amazon and its tributaries. Among these there are supposed to be several species new to science.

Escholtzia californica.—This plant, in some localities, is becoming quite wild. Its gaudy flowers, however, are a drawback, inasmuch as they attract the attention of passers by, and tempt the ruthless hand of childhood.—JOHN RANSON, York.

Erratum.—Allow me to point out to you what is palpably an error in Mr. Bradby's Naturalist's calendar, at p. 275 of the present volume. Under date April 26th, we read, "Cow parsley, *Melampyrum pratense* in flower." There can be little doubt that *Anthriscus sylvestris* was the plant intended, this being commonly known by the name of Cow parsley. *Melampyrum pratense* (Cow-wheat) does not begin to blossom until June.—JAMES BRITTEN.

News.

A Living Animal Extracted from the Human Eye.—A living hydatid, of the species *Cysticercus celluloso*, belonging to the entozoa, a series of insects inhabiting the internal parts of animals, was last week extracted from the eye of a female by Mr. Woolcott, the oculist, founder and late surgeon of the Kent County Ophthalmic Hospital, Maidstone. The animal had been perceived for some time floating unattached in the anterior chamber of the eye, and sight was almost entirely lost by frequent attacks of inflammation. The occurrence of the entozoon in the human eye is very rare, and this is the second case only which has come under Mr. Woolcott's treatment during twenty years' practice as an oculist The first came under his notice at the Ophthalmic Hospital in 1849, soon after that institution was founded: and, upon examination with the microscope after extraction, two of the progeny were found attached to the tail vesicle of the *Cysticercus.*—*Maidstone Journal.*

Scarcity of Lobsters.—The following letter has been addressed to the edltor of *Land and Water* :—"Sir,—It may be useful to your readers, or Mr. F. Buckland, to know that small lobsters are in demand to-day at 7s. 6d. each, and thatin consequence I have been obliged to substitute the insignificant shrimp as sauce to a turbot. W.H.W." Mr. Buckland appends a note as follows :—"I am not surprised at the information our correspondent is good enough to send. It is only just what one may expect, for at the breeding season tons of lobsters are annually sold in London, and their ova (called berries) can be seen in clusters like grapes under the tail, If we will persist in demanding the luxury of 'berried hens,' as they are called by the fishmongers, to figure on our tables as lobster salad or as sauce for turbot, we cannot expect that many young lobsters will be left to perpetuate the species. This is a subject requiring the most serious consideration and attention."—F. BUCKLAND, in "Land and Water."

Notes and Queries.

Mould on Lepidoptera.—In No. 41, page 255, headed Notes and Queries, I find "Mould in Lepidoptera." In answer to Mr. F. Wilkinson, I beg to inform him, through the pages of the *Naturalist*, that in the year 1861 I exhibited at the Infirmary Gardens a pentagon or figure of five sides, 18 inches high, which revolves on an upright axis. The outer base is 21½ inches diameter, the inner 19½ inches, turned in a lathe; each side is 7½ inches at the bottom, 5¼ inches at the top, tapering up to the before mentioned height, with glass fronts. Each of these sides I filled with moths and butterflies. At the top of this again I have another glass shade 8½ inches diameter, and 10 inches high; under this I have a triangular figure of three sides, this I have filled with Coleoptera, Neuroptera, Hymenoptera, and other insects. The three days of the exhibition were very wet, for the rain came through the covered canvass, and the pentagon and the whole of the insects were quite damp and moist. After I got them home I dried them by the fire, and carried them up stairs to their proper place. Then in the year 1862 I took every moth, &c., out at various times, and with a camel hair pencil I run down on the underside of the body, not the wings, of each and every moth and butterfly, a pencil dipped in spirits of wine, in which I had dissolved some bichloride of mercury (*corrosive sublimate*) previous to using; since then I have not seen any mould or any parasitical insect about them, and they are all and each of them in good preservation and colour, and exposed to the light on a north side, and from the sun's rays.—Joseph Blackburn, 42, St. Mary's-street, Mabgate, Leeds, Feb. 20th, 1866.

Earwigs.—In a communication to the Entomological Society, by Mr. S. Stone, of Brighthampton, in remarking on the scarcity of wasp nests last year, he says:—"That earwigs (which swarm to an extent I never before witnessed), wood-lice, and ants have been, in some degree, instrumental in causing the destruction of nests, especially during the earlier periods of their formation, I have had abundant opportunities of proving." And Professor Westwood said, "He had no doubt that earwigs, which were this year (1865) unprecedently numerous, were equally injurious to bees, penetrating the hives and consuming the larvæ." I have for some years paid great attention to earwigs, and I have bred many colonies, and I vouch for the accuracy of their being carnivorous, for when in confinement they will eat flies, and attack even the spider. At large their diet is very varied; nothing seems to come amiss. They are accused by bee-keepers of robbing the hives of the "bee-bread," thereby causing the death of the young brood; and some old bee-keepers even assert, that they do, as the Professor thinks, consume the larvæ. I have frequently found them buried in the petals of a double hollyhock, where they wait the arrival of Hymenopterous insects in search of food, when they fasten on the poor insects, which being entangled in the leaves of the flower, can make no defence, and thus fall an easy prey to their wily assailants. In their relations to one another, they are very kind, and the parents seem to be very anxious for the safety of their young. Unless forcibly broken up, the parents and their brood go together the whole winter, and may readily be found in the half of a bean, if a stalk is left standing in the garden. I account for the great number last year from the fact of the dryness of the season, which gave the young brood a chance of attaining a good size, and of casting their first coats. In wet weather, many of them perish; indeed few attain the period at which they cast their first coats.—John Ranson, York.

Original Articles.

A FLORA OF HIGH WYCOMBE.

By James Britten.

I. Introduction.

The county of Buckingham is to a very great extent *terra incognita* to the Botanist ; and it is in the hope of throwing some light on, and making some additions to its floral productions that the following pages have been written. While many at least of the neighbouring counties have been comparatively well investigated, and their treasures brought to light, Buckinghamshire has been overlooked—few, indeed, are the printed records of its rare plants, and those " few" very " far between." Although I hope, at a future period to publish a complete Flora of Bucks, my attention has been at present restricted to the southern portion of the county, or to the district which is comprised within a radius of five miles from the town of High Wycombe, which district also embraces small portions of three other counties :—Oxon, Herts and Berks ; and as I have had the assistance of one or two friends in working out the Botany of this neighbourhood, I have thought it better to publish a localised list, as nearly complete as possible, of its plants without further delay, hoping that this may form the nucleus of the Flora of the whole county.

II. Geological.

The close connection which exists between the plants of any district and the soil upon which they grow, cannot be overlooked; and I have therefore obtained from my friend Mr. Ullyett the following sketch of the Geology and general aspect of the country round Wycombe, which being entirely devoted to the description of localities subsequently mentioned, will in no way interfere with the paper already published by Mr. Browne, upon the same subject. :— *

" High Wycombe is situated in one of the numerous valleys of the Chiltern Hills, which form a portion of the Chalk System of England, as it stretches from the Thames in a N.E. direction till it sinks beneath the sea at the Wash. The valley lies nearly E. and W. and is bounded laterally by hills rising to the height of two or three hundred feet. In

* *Naturalist* vol. ii. p. 266.

consequence of this direction it lies open to the east winds, which make it very cold during their prevalence, but at the same time the town is to some extent sheltered from northerly ones. Several other valleys intersect the hills on both sides, but only one of them—the Hughenden—or more properly Hitchendean Valley, is watered by a stream. This however, is very often dry and when running is very small; it flows into the Wyck, formerly called the Ouse, a tributary of the Thames. Through these valleys go the high roads, winding round the slopes of the hills, along tracts of country most delightful from their tranquil scenery.

All the hills are composed of chalk, the uppermost of the Secondary Formations, and where sections have been cut, they have laid open to view the *Upper Chalk*, with numerous flints nearly always in regular lines of stratification, and the *Chalk marl* with scarcely any flints at all. Immediately beneath the *Upper Chalk* in a few localities, is found the *Chalk Rock*, which, owing to its greater hardness and durability is sometimes used for building purposes. Over the chalk is a thin stratum of soil, often only a few inches in depth, which produces clover and all kinds of cereals under the diligent hand of the husbandman. The only pasture land is to be found down in the valley. Numerous beech woods cover the sides of the hills, and form good hunting grounds both for the entomologist and the botanist.

The highest ground in the neighbourhood is that known as Whittington Park near Lane End, about four miles from Wycombe; it is a large wood consisting mostly of beech trees, the summit being crowned with a cluster of Scotch firs, which stand out in dark contrast to their lighter-hued brethren. It is very damp, in some parts boggy, notwithstanding its elevation; this is owing to a considerable thickness of clay that here caps the chalk; many plants mentioned in the list are peculiar to this locality. The village of Lane End stands on the Tertiary formation which has never been properly examined, but which is of the Middle Eocene period, many of the fossils found in it having been identified as belonging to the *Bagshot Beds*. Various kinds of sand, gravel, and clay are dug up here, and used for industrial purposes. It is evident to the eye of the geologist, as he stands on a summit commanding an extensive view, —on West Wycombe Hill for instance—that the London Clay, or some Tertiary deposit answering to it in contemporaniety, once covered *all* these hills, but has been washed off; all the summits appear to lie nearly in the

same plane, except Whittington Park, and Lane End, and these two, projecting only a few feet above the others are still covered with it ; but the majority of the others show either bare chalk immediately under the soil, or else perhaps a few feet of mingled clay and flints—probably the detritus of the floods that carried away the superincumbent formations.

The ground slopes gradually down to the River Thames, the valley of which is of considerable width in some parts, and consists chiefly of gravel, covered with a soil more suited for pasture than for arable land. It is peculiarly rich in its flora. The gravel has, no doubt, been deposited by fresh-water agency ; it is beautifully stratified, the layers consisting of fine gravel, coarse large flints, and very finely broken small ones, such as we see at the bottom of small running streams. The locality referred to as Fern Field near Well End, shows these bands well.

Downley Common is composed of gravel overlaying the chalk at a considerable height ; and further along, on that part of it called Naphill Common, we meet with *Boulder Drift*. This is composed of very tenacious, dark red loam, of the depth of which I am not certain, but I have seen excavations reaching to twenty feet, and from what I have heard I do not think the chalk lies much further down. This loam is unstratified, and devoid of shells ; it has in many places, heaps of chalk flints and pebbles, mixed with mud in great confusion. Immense boulders many tons in weight are dug out here, they are composed of a very compact sandstone, which is used in the form of small blocks for paving. They are found on the slope of the hill towards North Dean, in which latter place, and at Denner Hill, further on in the same direction, they are also dug out. On the S.W. slope of Naphill Common, in a field by the side of the lane leading to Bradenham Green, we find large boulders of conglomerate or plum-pudding stone, but no sandstone. I counted fifty, and from the protuberances of the turf, there were evidently as many more not far below the surface. They were continued along the Green as far as the Risborough road.

Fennel's Wood near Loudwater is mostly chalk, but in the highest part a considerable quantity of gravel has been left.

Several old hollow lanes wind down the sides of the hills in the neighbourhood of High Wycombe, some of which at least, in times of yore formed the beds of mountain torrents ; at the present time they are most delightful rambling places, decked in the utmost profusion with all kinds of climbing plants."

III. Explanatory.

I had originally intended to terminate the present list with the *Naiadaceæ*, as my attention had hitherto been devoted almost entirely to the higher Orders of Flowering Plants ; but I trust now to be able to carry it through to the *Filices*, as I shall be able to "look up" the *Glumaceæ*, &c., while the earlier portion of the list is in course of publication. I must, however, state my present inability to determine which we have of the multitudinous species of *Rubus* and *Salix*, but hope during the coming season, to do something towards the discrimination of the former at least.

The list is arranged according to the fifth edition of Babington's "Manual," a reference to which will be found after the name of each species, any remarks in inverted commas, coming before such reference, are taken from the "Manual" itself. The only other work from which frequent quotations are made, is the first volume of the Old Series of the "Phytologist," (*Phyt*, i. *O.S. pp.* 983—995.). which contains a long and useful list by G. G. Mill, Esq., of the plants of Great Marlow, and is here occasionally alluded to as the Marlow list. One or two other works are incidentally referred to. Among those who have personally rendered me assistance, I must thank especially, Miss Chandler, Dr. Bowstead, and Mr. Ullyett, of Wycombe ; Mr. J. C. Melvill, Mr. T. P. Lucas, and one or two others whose names I am not at liberty to mention, but whose communications are placed in inverted commas. The localities marked *MS.* are contained in a list of Loudwater plants kindly communicated by a friend.

The following are the signs which I have employed in the list ; when affixed to a *locality* instead of to a *species*, they are to be understood as regarding the species *in that locality only* :—

* *scarcely naturalised* in the district.

‡ *naturalised*, but probably originally introduced.

† "*Possibly introduced*, but now having the appearance of a true native."

[ ] Some doubt attaches to the species or locality thus enclosed ; or, the former is one never reckoned among British plants.

! Following a locality or authority, signifies that an authentic specimen has been seen.

For all the information for which no other authority has been given, I am responsible ; nor have I felt it necessary to quote from other works any particulars the accuracy of which I myself have proved. As I have exercised the greatest possible care and discrimination, not only in my own observa-

tions, but in collating those of others, I may perhaps hope that but few errors may be discovered. A short summary, with statistics, will be given when the list is completed; and I trust that the following pages will contain sufficient new and reliable information to render them not altogether valueless as a contribution to British Botany.

Class I. DICOTYLEDONES.

Division I. Thalamiflorae.

Order I.—RANUNCULACEÆ.

Clematis. *Linn.* Traveller's Joy.

C. vitalba, L. Bab. 3. Hedges, general.

Thalictrum. *Linn.* Meadow Rue.

T. flavum, L. Bab. 4. Hedgebanks in Newland; common by the Thames, and by the adjoining ditches.

Anemone. *Linn.* Windflower.

A. nemorosa, L. Bab. 4. Woods, general.

Note.—In some places, as at West Wycombe and Loudwater, the blossoms assume a deep red hue before withering; near the former locality a single specimen was once found, similar to that figured in *Science Gossip*, i. 105, having one of the sepals growing among the involucral leaves.

Adonis. *Linn.* Pheasant's Eye.

* *A. autumnalis*, L. "Rare." Bab. 5. Two or three specimens were found in 1864, in a field of saintfoin by the field path to Totteridge.

Myosurus. *Linn.* Mousetail.

M. minimus, L. Bab. 5. Corn and clover fields near Little Marlow, abundant; and in similar situations on the Berks side of the river near Cookham.

Note.—Occasionally found with the receptacle forked at the top.

Ranunculus. *Linn.* Crowfoot.

R. trichophyllus, Chaix. Bab. 5. If I am not mistaken as to this species, it grows in ponds and ditches near the Thames about Marlow, and also near Cookham, Berks.

R. heterophyllus, Sibth., Bab. 6. Ponds, general.

R. circinatus, Sibth. "Not common." Bab. 8. "Abundant in a pond at Little Marlow, not far from the Thames." *Mr. J. C. Melvill.*

R. fluitans, Lam. Bab. 8. In running streams, frequent.

R. hederaceus, L. Ivy-leaved Crowfoot. Bab. 8. Marshy ground on Lane End Common; "in ponds on a common by the Oxford road, about halfway between Marlow and Stokenchurch." *Phyt.* i. 983. *O.S.*, not common.

R. sceleratus, L. Celery leaved Crowfoot, Bab. 9. Marshy ground, and by ponds, frequent.

R. Flammula, L. Less Spearwort. Bab. 9. Whittington Park; Lane End; marshy meadows near the Thames, &c.

R. Lingua, L. Great Spearwort. "Rather rare." Bab. 10. "By the water called the Strand, Cookham," Berks. *Phyt.* i. 983, *O.S.*

R. Ficaria, L. Pilewort. Bab. 10. Woods and hedgebanks, common and very ornamental.

R. auricomus, L. Goldilocks. Bab. 10. Woods and banks.

R. acris, L. Bab. 10. Meadows and waysides.

R. repens, L. Bab. 10. Common in almost every situation; very luxuriant in watery places.

Note.—A variety having semi-double flowers is not unfrequent.

R. bulbosus, L. Bab. 10. Meadows, &c.

Note.—This and the four preceding species are indiscriminately called 'Buttercups' by children. A specimen having perfectly double blossoms was once found in a meadow near Wycombe; and specimens with semi-double flowers are of frequent occurrence.

† *R. arvensis*, L. Corn Crowfoot. Bab. 11. Cornfields, general, though not common in the immediate neighbourhood of Wycombe.

Note.—A most troublesome weed, and one which is much hated by farmers, who believe that it burns up the roots of the corn, and call it "starve acre." The extremely prickly nature of the carpels has earned for it the curious local name of "Devil o'both sides."

P. parviflorus, L. "Rare." Bab. 11. Hedgebank by the road from Sheepridge to Well End; "on the left bank of the Oxford road immediately out of Marlow." *Phyt.* i. 983. *O.S.*; hedgebank, Booker Common; bank at Littleworth, near Downley; near Penn Wood, *Mr. T. P. Lucas.*

Caltha. *Linn.* Marsh Marigold.

C. palustris, L. Bab. 11. Marshy ground and river sides.

Helleborus. *Linn.* Hellebore.

H. viridis, L. Bab. 12. Abundant in a wood near Kingshill, on the right of Boss Lane, between Boss Lane Farm and Cold Harbour; Matching's Wood, opposite Bradenham, above Avering Down Farm; hedgebank, Winch Bottom.

‡ *H. fœtidus*, L. Bear's-foot. Bab. 12. Plantation at the back of Bradenham House; Plantation, Hughenden Woods, above the middle lodge.

AQUILEGIA. *Linn.* Columbine.

A. vulgaris, L. "Not common." Bab. 12. In many of our woods, though seldom flowering. Dane Garden Wood, Hughenden Woods, Marlow Bottom, abundant; Bisham Wood, Berks.

DELPHINIUM. *Linn.* Larkspur.

* *D. consolida*, L. Bab. 12. Roadside, High Wycombe, 1861; in a meadow near the Rye, 1863, *Miss Chandler !*; in a clover field near Great Marlow, 1864; field above Keep Hill, 1864, *Miss Chandler !*; "one plant in a field on the Wycombe road, about half a mile from Marlow," 1864, *Mr. J. C. Melvill*; meadow, Little Marlow, 1864, *Miss Chandler*; near Cookham Lock, Berks; cornfield, Well End, 1865. Not permanently established in any of these localities.

ACONITUM. *Linn.* Monkshood.

‡ *A. Napellus*, L. Bab. 12. A small patch in Wycombe Park, near the waterfall.

ORDER II.—BERBERIDACEÆ.

BERBERIS. *Linn.* Barberry.

B. vulgaris, L. Bab. 13. Hedge at the foot of Keep Hill; ‡ also in a shrubbery, Wycombe Park, but probably there planted. Rare in this district.

ORDER III.—NYMPHÆACEÆ.

NYMPHÆA. *Linn.* White Waterlily.

N. alba, L. Bab. 14. In the Thames, abundant.

NUPHAR. *Sm.* Yellow Waterlily.

N. lutea, Sm. Bab. 14. With *N. alba*.

(To be continued.)

BIRDS NESTS.

By J. RANSON,

THE CREEPER. *Certhia familiaris.* This little bird may easily be overlooked by the casual observer, and, although I am generally on the look out when at work in my garden and about, I did not perceive a pair which had built a nest in a hole in an apple-tree, last year, until I accidentally saw the hen come out. The nest, which was made externally of dry grass,

mingled with very small twigs and moss, and lined with feathers, contained eight eggs, which, had I not had ample opportunity of knowing better, I should have said, were the eggs of the Titmouse.

Hedge Sparrow. *Accentor modularis.* This little plain and unassuming bird, is one of my feathered favourites, and last year I was favoured above measure with their confidence, for I had no less than seven nests in my garden ; four of which were in one stick heap. A friend of mine tied up a double wall-flower to a stick, and in the head of the plant thus bound up, a pair built a nest, and brought up four young ones. The nest was close to the garden seat, which was in daily use.

Bullfinch. *Pyrrhula vulgaris.* The nest of this handsome bird, is not generally found near the dwellings of men, but in woods. Last year, a nest was taken in this village in a hedge row, which borders the common causeway between two villages. The cock bird while sitting on a twig was killed by a stone thrown at it.

Blackheaded Bunting. *Emberiza schœniclus.* This bird is the water-sparrow, and ring-sparrow, of the North Yorkshire boys. It is common here and often finds its way with the common sparrow into the brick traps set in the fold yards during winter. The general site of the nest is near the water ; Yarrell says, it "is generally placed on the ground, among coarse long grass or rushes, at the foot of a thorn, or on the side of a canal bank." One I found last season, was about three feet high up in a road-side hedge, a very unusual place, the hen was taken with the nest.

Cole Titmouse. *Parus ater.* This little, restless entomologist, is very numerous in some parts, where old apple orchards are common. In this part of Yorkshire they are not so ; last year I found two nests, one in an old stump about a foot from the ground, and in the other case in a rat hole in an old " stoop." This nest was robbed three times by two young ladies, who succeeded in adding twenty one eggs to their string out of this one nest. After this the hen actually laid another setting ; sat on them, and brought off a brood.

Partridge. *Perdix cinerea.* Last season, a nest of a partridge was found in the hedge bottom, close by a stone heap, on the roadside. It contained the extraordinary number of thirty-two eggs. It was discovered by a man breaking stones, who showed it me. They were forsaken, I suppose by the noise and neighbourhood of the old man. I should suppose two hens had laid in this nest, as they often do. Patridges seem to me to like road-side situations for their nests ; perhaps for the purpose of dusting.

Linton-on-Ouse, February 1866.

ON THE ABUNDANCE OF *CYNTHIA CARDUI* AND OTHER LEPIDOPTERA IN 1865.

By G. F. Mathew.

The extreme abundance of *Cynthia cardui*, during the summer and autumn of 1865, in widely distant localities is a fact worthy of some slight notice. This species it is well known appears in some years in great numbers and the next season perhaps only half a dozen individuals are to be met with. Last year it seems to have been even more numerous than it has been for many previous seasons. I first noticed it in any quantity about the middle of July, in the neighbourhood of Bantry, County Cork. In this locality, a month later, 1864, I do not recollect having observed a single example. The next specimens were seen under most peculiar circumstances, viz., on the 4th August, while we were hove to on the broad Atlantic, in Latitude 51° 33″ N., Longitude 38° 17″ W., watching the "Great Eastern" in her fruitless endeavours to recover the broken cable; a butterfly was discovered by one of my messmates floating on the water close to the ship's side, and as he was aware of the interest I take in such matters, he called my attention to it; and I was surprised at seeing an apparently fresh *Cardui* on the water with wings spread out, still alive and struggling violently but in vain to regain its native element. It was quite calm at the time and had been so for several days, with the sea of course as smooth as glass. The next observed was on Sunday, the 6th August, while in Latitude 51° 26″ N., Longitude 38° 46″ W. There had been a dense fog during the early part of the morning, which cleared off at noon, and the sun shone out brightly. It was then while I was walking on deck that *Cardui* flew by and settled close before me expanding its wings to the sun. This specimen continued to fly about the ship the whole of the afternoon. These two butterflies must have taken a passage from Ireland either in the "Great Eastern" or the "Terrible." At St. John's, Newfoundland, *Cardui* occurred in the utmost profusion; indeed, with the exception of three examples of a *Pieris* and a few *Vanessa atalanta*, and *urticæ*, (which did not differ in any way from English specimens,) it was the only butterfly I observed during our visit to the island. It was not only abundant in the perfect state but also as larvæ and pupæ. On the 21st August I took a drive with two of my messmates some distance into the country, and *Cardui* swarmed on the wild flowers on each side of the road, flying up in our faces as we passed by and proving quite a nuisance.

In the neighbourhood of Portsmouth I noticed it commonly in September. Near Barnstaple it was also numerous. I take the following from my journal dated 30th September, 1865, :—"The abundance of *Cynthia Cardui*, *Macroglossa stellatarum*, and *Plusia gamma*, this season in the neighbourhood of Barnstaple, and indeed by all accounts throughout the country, is remarkable. While walking through a large clover field to day, the latter species rose by thousands and the air swarmed with them. This field is situated on a hill, and looking over the brow towards the horizon it appeared as if it was literally raining moths. *C. cardui*, was also very common in this field sucking the nectar from the purple clover flowers, while every now and then a golden *C. edusa* mingled with the throng. *M. stellatarum* I noticed by dozens at a time on our lawn, flying principally before the flowers of the verbena, scarlet geranium and fuschia. Sunday the 1st October, I sauntered out on the lawn, early before breakfast, while the dew was on the grass and the flowers smelt fresh and fragrant. In a large rustic basket, scarlet geraniums were in profuse bloom. Picking a bunch I held them in my hand and stood perfectly still, as there were several humming-bird moths feeding busily at the time, and I wished to see if my nosegay would attract them. I had not long to wait for presently one of these pretty Hawk moths approached and hovering in front of me proceeded deliberately to rifle each flower of its sweets, introducing its long spiral tongue into flower after flower, and so close was it to my face that I could distinctly feel the wind produced by the rapid vibrations of its wings. This certainly is one of the most interesting Lepidoptera we possess. Who would imagine such an aërial being was the produce of a green crawling caterpillar, feeding a month ago on some neighbouring plant of *Galium ?* On our lawn, growing out of an old rotten moat is a large standard fuschia which was much frequented by *M. stellatarum* and next to this is a standard pink thorn now covered thickly with bright red berries. I often saw these moths fly from the fuschia to the berries and hover before several ere they discovered their mistake. This proves that they are guided by sight and not by smell in seeking for their food." During November *Cardui* and *stellatarum* were abundant at Malta, and I have seen many of the former species in ragged attire still on the wing here, at Corfu, where it is now cold at nights.—My father writing to me, dated, 8th October, observes :—"On Thursday afternoon, while passing a garden we saw on three or four large plants of Michaelmas daisy about a hundred painted ladies sitting as thick as they could, they were all bright and fresh, and looked beautiful in the sun. Did you ever hear of such a number

having been seen together?" In conclusion I may observe that *C. cardui*, appears to be generally distributed throughout Europe, Asia, Africa, and America.

H. M. S. Terrible, Corfu, 2nd January, 1866.

NOTES ON BRITISH MOSSES.

No. V.

By Chas. P. Hobkirk.

Grimmia Eugyria, Wils. M.S.

My friend, Dr. F. Buchanan White, of Perth, has kindly forwarded me a small specimen of a moss new to science, gathered by himself during the past season at Stenton Rock, Perth. Stenton Rock I am informed by Dr. White is by no means a large place, and would appear to consist principally, if not entirely of Trap. The moss which he found here has been provisionally named by Mr. Wilson, *Grimmia Eugyria*, and appears to be allied to *G. alpestris*, and *G. Doniana;* the inflorescence seems to be both monoicous and dioicous, more frequently the latter. In the absence of any diagnosis from fresh specimens I am unable to give any description of this moss and therefore merely wish to record its having been found in the locality above named; but I hope ere long that the readers of the *Naturalist* will be put in possession of its specific characteristics from the pen of the eminent bryologist who has given it its provisional name.

Stenton Rock appears to be rich in mosses, Dr. White having gathered there besides the species just named, *Grimmia commutata*, *G. trichophylla*, *G. Schultzii*, *G. leucophea*, *G. pulvinata*, *Tortula intermedia*, *T. tortuoso*, *T. subulata*, *T. papillosa*, *T. ruralis*, *Weissia controversa*, *W. crispula*, *Zygodon viride*, *Z. Mougeotii*, *Bryum alpinum*, *Bartramia pomiformis*, *B. ithiphylla*, *B. fontana*, *Leucodon sciuroides*, *Pterogonium filiforme*, *Hypnum plumosum*, *Didymodon rigidulum*, and many other commoner species. Also *Asplenium germanicum*, *A. septentrionale*, *A. trichomanes*, *A. Adiantum-nigrum*, *A. Ruta-muraria*, with *Anchusa sempervirens*, *Mentha natans*, *Asperula odorata*, *Arabis hirsuta*, several *Gerania*, &c.

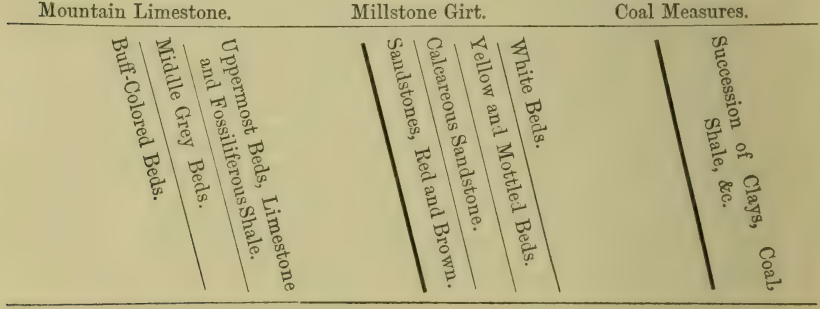
The following *Hypna*, rarely found in fruit in Britain have been found fruited by Dr. White in the vicinity of Perth;—*H. piliferum*, *Schreberi*, *splendens*, *triquetrum*, *purum*, *squarrosum*, *tamariscinum*, and *rivulare*.

Correspondence.

To the Editors of the Naturalist.

GENTLEMEN.—As a member of the Oswestry and Welshpool Naturalists' Field Club, I thank you for the kind notice of our "Report of Proceedings" which appeared in your number of the 15th February, and also for the special notice you took of my short paper on the Fossiliferous character of the Millstone Grit in this neighbourhood.

I do not wonder at your hesitation in accepting these beds as belonging to that Formation, but I can assure you, that I have not made any stratigraphical mistake respecting them, nor can they be assigned to the impure sandy limestone mentioned in my paper on the mountain limestone; for both at Sweeney and at other places I have traced detailed sections from the base of the Mountain Limestone to the Coal measures, the general order being thus :



The fossils are found throughout the whole series of Millstone Grit beds, not uniformly distributed, but occurring plentifully in places. The fauna is decidedly carboniferous, and, as might be expected, occupies an intermediate place between the Carboniferous Limestone and the Coal Measures. One Brachiopod, *Productus semireticulatus* which first appears at the base of the Carboniferous Limestone is continued throughout the whole range of the Millstone Grit beds, and in their upper portion is associated with stems of Calamites.

I am, Gentlemen,

Your's truly,

D. C. DAVIES.

Coneygreen House, Oswestry, March 2nd, 1866.

Observation.

Occurrence of Gonoptera libatrix at Huddersfield.—At the meeting of the Huddersfield Naturalists' Society, held on Saturday, March 3rd, Mr. John Varley exhibited *Gonoptera libatrix*, caught at Bradley Mills, among Logwood, by E. Tindall, Jun., on the 21st of February last. This seems to be a rare capture in this district. The moth was a female, and has deposited a number of ova which Mr. Varley expects to rear.—J. Tindall, Huddersfield, March 10th, 1866.

Original Articles.

BIRDS *VERSUS* INSECTS.

By E. F. Firby, F.R.A.S., F.A.S.L., F.E.S., &c.

That we may the better understand the importance of birds to mankind, let us examine the lives and habits of these little creatures, and the position assigned to them in the marvellous economy of nature. A simple and general survey of their organization and mode of existence will at once show us that the orders of birds the daily and principal food of which is drawn chiefly, if not entirely, from the animal world, are those which exist both in the greatest numbers and the greatest variety. In Germany and Switzerland one hundred and fifty different species are known, some sedentary, others more or less nomadic. The most numerous order of all is that of the *Insectivora*, which includes the warbler, *Sylvia hortensis*, the willow wren, *Sylvia trochilus*, Lath., the stonechat *Sylvia rubicola*, the lark, *Alauda arvensis*, the Alpine warbler *Accentor alpinus*, the wagtail, *Motacilla*, the field lark, *Anthus arboreus*, the great titmouse, *Parus major*, the spotted flycatcher, *Muscicapa grisola*, the thrush, *Turdus musicus*, the great cinereous shrike, *Lanius excubitor*,—the order numbering altogether more than eighty species. Few of these eat vegetable food, by far the larger number living exclusively upon animal food. The next most numerous order—that of the *Palmipedes*,—of which there are about forty species (some of which are rarely seen in this

country,) also lives for the most part on animal food. The *Grallæ*, which form a group of about thirty species, are almost entirely dependant on animal food. Birds of prey—*Raptores*—numbering as many species as the preceding order, of course are exclusively zoophagous in their habits ; whilst of the *Gallinæ*, in which they are about twenty known species, the following members prefer animal food ;—the water-rail, *Rallus aquaticus*, the common Coot, *Fulica atra* ; the Partridge, *Perdix*, Woodgrouse, *Tetrao*, bustard *Otis turda*, do so at certain periods. The *Zygodactyli*, consisting of twelve species, are very eager after animaculæ ; the European Nuthatch, *Sitta Europæa*, the Wryneck *Yunx torquilla*, and possibly the Woodpecker *Picus*, and Cuckoo, *Cuculus canorus*, being the only zygodactylous birds which, during the autumnal months, eat berries and seeds. The order *Granivora*, which includes the familes of the Chaffinch, *Fringilla*, the house Sparrow, *F. ingilla domestica*, the Linnet *F. cannabina*, the Bunting, *Emberiza*, the Hawfinch, *Coccothraustes vulgaris*,—in all about thirty species,—have not a full right to the name which their order bears, since all the buntings, all the chaffinches, and all the sparrows consume during the summer as much animal as vegetable matter, if not more. The only birds of an exclusively phytophagous nature are the pigeon tribe, *Columbidæ*, including about five species.

Thus one order only, comprising but one single family, together with a few sporadic families taken from other orders, forming when put together but one-twelfth or one thirteenth part of our birds, constitute the total of those which exclusively consume vegetable food. There is also another fact, which may not be devoid of interest to the cultivator of the soil, viz. :—that the *Granivora*, principally choose and prefer the seeds of obnoxious plants, of which they thus destroy immense quantities. This rapid and superficial survey is suggestive of highly important considerations. It brings under our notice the great and invariable harmony existing in Nature in the distribution of the earth's productions ; for when we come to consider the sort of animal food that birds make use of, we cannot deny that they tend to the preservation of the vegetable kingdom. In effect, all the *Insectivora*, the *Zygodactyli*, the *Grallatores*, nearly all the *Palmipedes*, the species of *Gallinæ* and of *Corvi*, a part of the *Granivora*, and even the greater number of the *Raptores*, either feed exclusively or partially on those classes of animals, such as *Coleoptera*, *Neuroptera*, *Hymenoptera*, *Rhinosimus*, *Crustacea*, *Mollusca Arachnida*, with slugs, worms, flies, larvæ, &c., which by their extraordinary

powers of reproduction threaten, and sometimes more than threaten, to destroy the vegetation existing upon the earth's surface. Many of the larger birds feed also on mice and reptiles, which, though insectivorous themselves, would end in being troublesome through their multiplicity. We thus observe that Providence, which overrules the whole economy of nature, and preserves a proper equilibrium, does not always utilise the simplest and shortest way of realising the accomplishment of its object ; but its views are themselves so varied, that innumerable agents are constantly at work to secure the ultimate end. It unfolds itself in a thousand multiform shapes, and displays the wealth of its resources in apparently contradictory contrasts. Thus, in the Insect world, we meet an assigned limitation, in combination with infinite variety of form and immense profusion of species. Like Birds and Mammalia it possesses its Herbivora and Carnivora most wisely distributed. Where vegetation is most luxuriant, we find more Coleoptera than Phanerogamia ; and amongst these beetles the Herbivora predominate. In mountainous districts the Phanerogamia surpass the Coleoptera in numbers ; whilst in the higher snow regions of the Alps, these last disappear long before the former ; and amongst the insects and spiders which exist beyond the limits of eternal snow the Carnivora are more numerous than the Herbivora, this arrangement being evidently for the express purpose of protecting these last and scanty remnants of vegetation.

The vegetable world is the grand, the fundamental base on which the higher orders of creation are built up. Without plants, animals cannot exist ; for even the Carnivora are indirectly dependent on vegetation for existence. If Providence is pleased to produce innumerable hosts and varieties of the smaller animals, it imposes, as it were, a certain limit on itself by proportionately and gradually placing, where necessary, numbers of Carnivora ; and if the wide spread tribe of birds be destined to subsist on animals of an inferior order, it thus provides a means for the maintenance of a perfect balance between the protectors and the destroyers of vegetable life. Birds are Nature's soldiers, and keep in subjection the inferior animals. If some amongst them constitute an excellent part of the food of man, furnish him with eggs, with useful feathers, or with a good manure, all these services, great as they undoubtedly are, are scarcely worthy of notice when compared with their labours in the destruction of insects. For this especial duty the most essential of their organs have been admirably adapted—their vision is piercing, and even the smallest among them possess the most extraordinary powers of digestion—whilst their great activity and lightness enable them to

exercise their vocation incessantly and where most requisite. The reproductive powers of birds and their wonderful instinct of migration are also due to the nature of the office imposed upon them. When in the North the insect world relapses into its wintry hybernation, and sleeps under layers of deep snow, most of the bird tribe betake themselves to the warmer latitudes of the south, there to continue the performance of the same duties; whilst those which remain all the year round in one place gather up the larvæ, the ova, the nests of insects, the few flies or spiders which may be tempted out of their hyemal recesses by some stray sunbeam, and the Coleoptera which gnaw at the bark of trees.

In these days it would almost appear as if the great and important services rendered by birds were insufficient for the purpose; for complaints are heard from Germany and Switzerland that they are invaded by swarms of those varieties of destructive insects which are habitually seen in small numbers only. They lay waste green meadows, vegetable gardens, crops of wheat or flax, fruit trees, and forests, and they torment alike animals and men, take the inhabitants by surprise, and destroy their prospects.

Among the destructive beetles we may mention the *Acanthopoda*, the *Astynomus ædili*, the *Anthonomus*, the *Bostrichus typographus*, which in 1780 and the following years destroyed more than a million of fir-trees in the Hartz mountains, and in Switzerland, and more recently committed other awful depredations; and lastly, the *Hydrophilus atei*, a very dangerous insect for preserved fish-ponds.—Several species of butterflies, otherwise so innocent, belong when in the larval state to the class of pernicious articulated animals; the principal of these are the *Bombyx processionea*, the *Phalena bombyx*, the *Pieris*, the *Lasiocampa*, the *Neustria*, and the *Tinea*. As for the other sorts of inferior insects, such as *Gryllotalpa*, the *Aphis*, the grasshop per, the ant, different species of the gadfly, wasps, flies, worms, and snails, it is almost needless to speak of them, they are but too well known as plagues. The *Acridium migratorium* has already penetrated into Southern Switzerland and we are forced to come to the conclusion that the number of destructive insects in general is gradually augmenting on the Continent. This arises evidently from the diminution of insectivorous birds, which is in a precise ratio to the increase of insects, and if we investigate the causes of this diminution we shall find more than one, both in this and other lands. Generally speaking, the progressive cultivation of the soil is not very favourable to animals living in a state of freedom. It has already driven the fallow deer from the woods; the elk, the lynx, the wolf, the bear, the ibex from the

mountains ; the beaver from the rivers. But it has been especially hostile to birds ; the hospitable thickets and sheltering copses diminish annually ; man forces onward the boundaries of his domain ; he renders the, as yet, uncultivated soil subservient to his interests, and draws from it rich harvests. Large tracts of woodland are cleared to supply the wants of an increasing population, and the heavy demands of industry. The large trees formerly left standing in the midst of a field, in which numberless small animals found a refuge, are made away with, or replaced sometimes by small fruit trees. Long rows of hedges, the hiding-place of a whole host of birds, meet with the like fate ; and these, too, were of other use, for they would attract quantities of caterpillars, which would feed on their green leaves, and thus spare the orchards. All the little nooks so useful to birds, both as places of nidification and hunting grounds, disappear one by one. In woods, the mistake of cutting down right and left old trees full of decayed cavities, has been, unfortunately understood and appreciated too late, and thereby numbers of the best Insectivora have been deprived of commodious nesting places ; unavailing regrets from those incessantly exposed to the havoc of wood insects will follow on the disappearance, for years to come, of their best and most active allies of the forest. United, the causes we have just referred to would alone be sufficient to explain the heavy and sensible diminution of small birds ; but there are others of considerable consequence, for instance, the frequent netting and shooting by man, and the destruction of nests by children and cats. In some countries no nest is out of reach, and none are left unplundered ; and it is especially the most useful destroyers of insects which are plundered in quantities, such as the titmouse, the chaffinch, the warbler, and the redbreast. Nightingales in some places have become so exceedingly scarce, that in spots formerly enlivened by their songs every spring, they have not been heard or seen for many years.

But the cause which exercises a still more fatal influence on the diminution of our most useful birds of passage, is the exterminating hunt they are subjected to on the part of the Italians. It is a well-known fact that at the period of their spring migration, and still more in autumn, the Italians are seized with a kind of mania for killing small birds. Men of all ages and conditions, *nobili*, merchants, priests, artisans, and peasants, all abandon their usual avocations, to attack, like banditti, the troops of passing visitors. By the river-side, in the fields, all around is heard the report of fire-arms ; nets are laid, traps set, twigs besmeared with bird-lime hang on every bush. On every hill adapted to the purpose is placed a sort of trap *(roccolo)* full of owls

and sparrow-hawks, to attract and slaughter the little migrant. The objects of their pursuit are not those birds which in other countries are usually selected for purposes of sport ; on the contrary, they select the little Insectivora, the singing-birds, and particularly the nightingales. Even Swallows birds generally protected by man—are taken in quantities, and often in a most cruel manner. To form some approximate idea of the slaughter which for weeks together is the chief delight of the population of Italy, it is sufficient to mention that in one district on the shores of the Lago Maggiore, the number of small birds annually destroyed amounts to between 60,000 and 70,000 ; and that in Lombardy, in one single *roccolo*, 15,000 birds are very often captured in a day. In the neighbourhood of Bergamo, Verona, and Brescia, several millions of birds are slaughtered every autumn, and the exterminating fever rages with quite as much violence in the southern as in the northern districts. In the island of Sicily, for instance, during ten days in autumn, nearly 1,000,000 of larks arrive daily on the coast, and immediately on their appearance are met by a continuous file-firing from hundreds of amateur sportsmen (?) who bring them down in thousands.

This purely Italian mania has penetrated into Switzerland; in the Canton Ticino, where no prohibitory laws exist to prevent the increasing passion for the barbarous sport, the inhabitants entrap on the frontiers of their Canton on the St. Gotthard and the Grison mountains, as many of the songsters, when they attempt to migrate, as they possibly can. We cannot prevent the Italians from indulging in their absurd and barbarous amusements, but we can mitigate the evil in some degree ; and it would be but consistent with the proverbial good sense of the English if we were to shelter with the *ægis* of our protection all the bird-tribe with a solicitude proportionate to the insane attacks made upon them in southern Europe, and thus in some degree, no matter how slight so ever it may be, reinstate the order of nature, and aid in re-establishing the necessary equilibrium between the insect world and its enemies. We have two ways of accomplishing our object—by favouring the propagation and increase of our most useful autochthonous and sedentary birds, and by affording good asylum, and places of refuge to birds of passage during their summer sojourn with us.

It is, however, preposterous to depend entirely on artificial means for a complete restoration of Nature's violated laws : the force of reproduction is so prodigious amongst inferior animals, that man will never be enabled to combat alone successfully their periodic invasions. On the borders of the Rhine, the *Attelabus bacchus* damages the vineyards, and the *Anthonomus* and

Phalena the fruit-trees, to an extent which may be appraised at several hundred thousand thalers (3s.) annually, without a remedy against such ravages having as yet been discovered. Near Torgau, several thousand thalers have been annually expended on the forest of Annaburg, for the destruction of caterpillars and chafers, in the attempt to save the forest trees from utter annihilation. During the year 1837, an area of 860 acres of fir-forest was entirely defoliated by the larvæ of the *Noctuæ*, and Government paid more than a thousand thalers for the destruction of 94,000,000 of the above-named dangerous insects. The havoc these insects cause is almost incredible. Some time ago caterpillars devoured all the grass over immense districts in America, and the importation of hay from England was found necessary to make up, in part, the great loss thereby sustained. The Herbivorous larvæ laid bare the plains of Lesch, near Augsburg, gnawing the roots of every plant, and destroying the herbage growing for miles around several villages. The caterpillars of the *Noctua plenipeda* will in a few weeks time destroy 300 acres of woodland; and in the marshes of Brandenburg, in two years, they devastated a seventh part of all the Government forests. In Franconia, the caterpillars of the *Bombyx* and *Lasiocampa*, during the year 1859, completely devoured the produce of 2,200 acres of Government forest, in defiance of the strenuous efforts made to combat the evil. A success was obtained in the woods of Stralsund, where in 1840, Government, at an expense of about 3,200 thalers, collected 1,000 pounds' weight, that is, more than 633,000,000 of the eggs of the *Bombyx*. The vegetable-consuming caterpillars occasionally appear in such numbers, that large vessels might soon be filled with them. They arrive in a field, quickly destroy the principal part of the crop, and then journey on, it being impossible to interpose any effectual barrier to their progress. It has been observed in the Duchy of Hesse, that these insects principally committed their devastations on those spots where, from the want of trees, the aggregation of singing-birds was prevented, and here all human attempts at prevention have been found utterly abortive and unavailing.

For about half a century the culture of fruit-trees has been steadily increasing in Wurtemburg, so that now it brings in a revenue of 1,700,000 florins (£141,750), annually, though a great part of the crop is yearly devoured by caterpillars. Formerly but little notice was taken of these invaders, but latterly they have so much increased that many cultivators have been discouraged from continuing their occupation. Government has ordered all the trees to be cleansed, both at spring and autumn, imposing

penalties for disobedience, but the desired result has not yet been obtained. If Nature did not interpose, man would of necessity succumb ; but these insects are pursued by other enemies which become the valuable allies of man. The *Ichneumon* pierces the caterpllar to death by its act of oviposition, the *Limex* preys upon its vital organs, beetles feed upon them, principally the pernicious *Processionea* caterpillar; and the shrew mouse, the hedge-hog, the mole, the lizard, the frog, the toad, and the bat or flittermouse are all excellent insect-hunters. Nature, however, has displayed most solicitude for us by appointing, as the food most sought for by birds, eggs and larva of butterflies, gnats, aphides, ants, snails, worms, &c., and by giving to each species its assigned duty and place in the grand work of destruction.

In order duly to appreciate the immensity of the work undertaken by birds, we will just notice a few facts brought under our observation. In a green-house, three full-grown rose-bushes were covered by about 2,000 aphides ; a blackcap (*Sylvia atracapilla*) was introduced, and allowed to roam about in freedom, and in the space of a few hours the whole multitude of insects were devoured, and the plants thoroughly cleansed. The titmouse fortunately multiplies considerably, and renders great service, chiefly to shrubs and fruit-trees, eating up millions of the eggs of caterpillars. Everyone is aware of the enormous quantities of eggs caterpillars lay at one time, some species 150, and others 500, 600, and even 800 at one time. The *Noctua*, for example, lays about 600 eggs twice each summer. The titmouse, like most other birds, does not attack the hairy caterpillar, but it daily swallows thousands of its eggs. Count Casimir Woszicke mentions a conclusive example of the signal services this bird renders to our gardens :—

"During the year 1848 an enormous quantity of the *Bombyx dispar* (the well-known enemy of gardens, and which also commits serious depredations in woods) had devoured the foliage of my trees, so that they were quite bare. I discovered in autumn millions of eggs enveloped in a silky sort of covering, and attached to the trunks and branches. I had them removed at a considerable expense, but soon became aware that the hand of man was powerless to ward off the infliction, and resigned myself to the loss of my best trees. But on the approach of winter several bands of the titmouse and the wren (*Sylvia troglodytes,*) paid daily visits to my trees, and soon the caterpillar eggs were in a fair way of dimunition. At spring-time about twenty couple of the titmouse built their nests in my garden; the ensuing summer the depredations of the caterpillar were greatly lessened, and in 1850 my little winged gardeners had so well cleansed all my trees, that, thanks to their labour, I had the satisfaction of seeing them in full leaf the whole of the summer."

The indefatigable wren, which remains with us during the winter, is of very great use, for its appetite equals its activity. They must perpetually be swallowing something, and accustom their young to follow their example in

gluttony, by feeding them on an average, thirty-six times every hour with insects' eggs, larvæ, &c. A hungry redstart (*Sylvia phœnicurus*) captured in a room, during the space of an hour, 600 flies ; and if this little creature hunts but for two or three hours every day, we may calculate the number of its prey. The swallow and the martin (*Hirundo*) in the daytime, and the European goat-sucker or night-jar (*Caprimulgus Europæus*) during the night, capture swarms of gnats ; the chaffinch, the jay, the jackdaw (*Corvus monedula*,) devour the *Lasiocampa* and the *Noctua*. Even sparrows may be included in the catalogue of useful birds, notwithstanding the damage they cause at times to the orchard or corn-field, because they feed their young (which can boast of pretty good appetites) exclusively upon larvæ, grasshoppers, beetles, worms, or ants ; and both old and young at the commencement of autumn are to be generally found feeding on the seeds of weeds and other obnoxious plants. A pair of sparrows will consume in food for their young nestlings about 3,000 insects weekly, each parent bringing a beakful thirty times an hour. These services are well deserving of a few cherries. The field sparrow does not, moreover, eat cherries, and a small number of these birds will soon clear many shrubs and rose trees from the pernicious aphides. When field sparrows feed in a corn-field they ought merely to be warned off, not destroyed, unless indeed, there be many insectivorous birds near at hand. Sensible gardeners every year more and more discountenance the ruthless slaughter of sparrows.

All the species of warblers, the reed wren, the yellow wren, the wagtail, the stonechat, *Saxicola rubicola*, as well as the different sort of shrikes or butcher-birds, are excellent insect hunters, and particularly the spotted fly-catcher, *Muscicapa grisola*, which bird it is better to keep at a distance from the apiary, as it owns a decided taste for the sweets of the bee-hive. Swallows are most active insectivora—in Germany they are captured for food, a custom which cannot be too strongly reprehended—and is therefore a very valuable assistant to man, in the destruction of insects. We will just now notice a few of the larger class of birds, which are of very important use to our cereals. The cuckoo, *Cuculus canorus*, is the first on the list. Nature has formed this very remarkable bird for the express destruction of hirsute caterpillars, which other birds cannot eat, and has organised its stomach for the easy digestion of such food. In the year 1847 an immense forest in Pomerania was on the verge of complete ruin, caused by the havoc and ravages of caterpillars. It was suddenly and most unexpectedly saved by the advent of a band of cuckoos, who, though on the point of migrating, estab-

lished themselves in the vicinity for a few weeks, and so thoroughly depopulated each tree that the ensuing year neither depredators nor depredations were to be seen. The cuckoo, like the smaller insectivora, eats all the day long, for the caterpillar is full of aqueous matter and contains but little solid nutriment. By careful observation it has been ascertained that the cuckoo devours on an average one caterpillar every five minutes, or 170 in a long day. The capillaceous stuff adheres to the mucous membrane of the bird's stomach, so as very often totally to cover it with a capillose lining. If we assume that one-half of the destroyed insects are females, and that each contains about 500 ova, one single cuckoo daily prevents the reproduction of 42,500 destructive caterpillars. The woodpecker almost rivals the cuckoo in utility, and, though unappreciated, is the good genius of the woods. Their chief victims are some very mischievous insects, such as the *Noctua*, the *Lasiocampa*, the *Sphinx pinastri*, the *Tisodes pini*, the *Trachea piniperda*, &c. Amongst birds of prey, *Raptores*, many insectivora are to be found, and such often are well worthy of protection. All the smaller birds of prey, as also some larger ones, feed their young on insects, and they themselves, when incubating, scarcely touch anything else. The most useful members of the order incontestably are owls, which being extraordinarily gifted for the work, devour in their twilight haunts immense quantities of insects, principally nocturnal lepidoptera and their larvæ. Some species of the owl are noted, together with the rook, *Corvus frugilegus*, the jackdaw, *C. monedula*, the jay, *C. glandarius*, and the great cinereous sentinel Shrike, *Lanius excubitor*, for their destruction of cockchafers. A tawny owl, *Strix aluco*, Linn., was once dissected at Berlin, and its stomach discovered to be full of insects, and amongst these were at least seventy-five caterpillars of the *Sphinx pinastri*; in the destruction, as well, of field mice and rats they render services the importance of which is but seldom recognised. The Rev. Gilbert White once watched for a length of time a pair of Barn Owls, *Strix flammea*, and noticed that they brought a mouse to their nest, on an average every five minutes; a couple of the little owls carried to their young, eleven mice in the course of an evening in the month of June. Nothing can be more absurb than the way in which these birds are hunted down by ignorant rustics and ploughmen, whose chief delight is to have a few of them pilloried up against the doors of farm-yard buildings. A great number of diurnal birds of prey, such as the sparrow-hawk, *Falco nisus*, and the kite, *Falco milvus*, are mischievous, for they slaughter indiscriminately the more diminutive useful birds and even the smallest of their class devour as many birds as insects. Still

the kestrel-falcon, *Falco tinnunculus*, not a very uncommon bird with us, eats so many beetles, grasshoppers, and field-mice, that its utility in this respect is a sufficient compensation for the injury it may otherwise cause. The same description is applicable to the hobby falcon, *Falco subbuteo*. A flight of these last birds lately passed over the Canton de Vaud, and alighted on the trees standing round the village of Nouvion. The inhabitants fancying them to be pigeons, killed a few; but when they saw the *empressment* with which the bird sought after and devoured cockchafers, they had the wisdom to desist from their ignorant amusement. The most useful and at the same time one of the most common birds of prey, is the common buzzard, *Falco buteo*, so often mistaken for the injurious goshawk, *Falco palumbarius*; it destroys immense quantities of rats, mice, snakes, &c. More than twenty mice have been found at one time in the stomach of a bird of this class, while Steinmuller once dissected one which had no less than seven *Anguis fragilis*, and thirteen *Gryllotalpæ* in its stomach. The annual consumption of one single bird has been computed to average about 4,000 mice.

It is not my intention here to call attention to all the useful birds in detail, but merely to some of the most remarkable of them, with a view to showing how great is their importance to all branches of agriculture. Without these active little creatures, agriculture and vegetation would be impossibilities, they perform an Augæan labour which millions of human digits could neither do with the same facility nor half the completeness.

We have yet to treat of an order of birds, numbering several families, which appear in great numbers and play an important part in the economy of nature,—we mean the crow tribe, *Corvidæ*. It is of course difficult to judge them all in an aggregate body, for the different species vary in their mode of life. The jay belongs to this class, and destroys quantities of insects, but damages the seeds of forest-trees, and attacks nests of small birds, devouring their eggs, and young; it is not a little remarkable for its destruction of venomous vipers. The jay is injurious to many crops; it has been seen to tear off a wheat-ear whilst in full flight and swallow it whole. The same may be said of the crow, *Corvus corone*, which at the period of nidification, manifests the carnivorous disposition of a real bird of prey, and carries off quails, young ducks, partridges, and even leverets. The magpie, *C. pica*, decidedly does more harm than good; voracious and possessed of a species of vulpine cunning, it does not rest satisfied with young birds merely, but hunts perpetually those of all ages. The most useful and

innocent members of the above order are the jackdaw, *Corvus monedulâ*, and the rook-crow, *Corvus frugilegus*, which feed a great deal on cockchafers, snails, earthworms, mole-crickets, and mice. Those few birds which live exclusively on vegetable products would appear *primâ facie*, to be hostile to mankind, and to be very injurious to the cultivator of the soil. This apprehension is more imaginary than real; man is too much inclined to overlook and forget the great indirect profit he derives from the Granivora, and only to look upon the damage they cause at certain periods. Do not they destroy quantities of the seed of all kinds of weeds? And how can the agriculturist (as happens in most countries) look upon the woodpigeon as a real plague? Let him but take time to observe how those birds consume the seeds of the nigella, the wild poppy, and several noxious varieties of the euphorbia, which no domesticated animal will eat, as observed by Glauser. For the above reason pigeons are now strictly preserved in Belgium. The crossbill, *Loxia curvirostris*, and the aberdevine or siskin *Carduelis spinus*, eat, it is true, many seeds of trees, but they also consume great quantities of burdock seeds; others again of the Granivora, the mountain linnet or twite, *Fringilla montium*, the brambling finch, *Fringilla montifringilla*, &c., eat abundantly of the seeds of plaintain, wild poppy, burdock, chickweed, groundsel, sowthistle, and other noxious weeds. The bullfinch, *Loxia pyrrhula*, on the contrary commits depredations amongst blossoms; whilst the hawfinch *Coccothraustes vulgaris*, despoils cherry-trees to obtain the kernel of the fruit; these two last species, however, do not often obtrude themselves in our way.

This rapid and imperfect survey of the economy of nature is sufficient to convince us that we have numerous and vigorous auxiliaries always at hand to arrest the ever threatening invasions of predacious and destructive insects; it is our duty to aid and encourage their increase and employ their energies for the advancement of agrarian cultivation. We must begin then by abstaining from shooting useful birds, by favouring their reproduction, and by familiarising them with our persons; bird-netting is an abuse unfortunately too frequently indulged in, but it ought to be banished from the vicinity of all cultivated lands, as being extremely detrimental to agriculture. If one only reflects how much the little creatures help to enliven our fields and gardens with their gay chirruping, their fine plumage, their active and lively ways,—and how many victims are sacrificed before one is secured to bear for a few short years the tedious imprisonment of the cage—it is utterly impossible to feel any sympathy for bird-catchers. If sport is to extend beyond the birds required for our use—if children find an amusement in entrapping the tit-

mouse, the warbler, the nightingale, the chaffinch, the lark, the redbreast,—is it not both a crime and a great folly? and will not the inevitable result be the total loss of our harvests and most useful fruits? Why should we criminally interfere in the Divine organization of Nature? why ruthlessly slaughter our firmest allies and most valuable auxiliaries? Why lift our hands against our benefactors and protectors from Nature's worst destroyers? If woodmen and peasants could be made to understand the immense services the cuckoo, the owl, and the woodpecker, render to mankind, they certainly would protect those valuable servants from the useless destruction to which they are, alas! almost everywhere subjected.

The governments of many German States have issued ordinances to prevent the indiscriminate slaughter of singing birds; this very good example has been set by Hesse, Baden, Wurtemburg, and Prussia. In Saxony a heavy fine is imposed on any person found capturing a nightingale, and for every bird kept in a cage a tax of five thalers (15s.) is levied. This law does not extend to the Saxon duchies, nor the forests of Thuringia, where in every village no inhabitant is without his caged songster, and some have as many as thirty or forty different species. Amongst those who have zealously employed their talents for the protection of small birds and have further advocated attention to their increase, may be mentioned the names of Lenz of Schrepfenthal, Gloger of Berlin, and Schott de Schottenstein of Ulm.

Reader take the work of preservation to heart! You have looked into the admirable economy of Nature which God has so wisely ordained and organised, manifesting His power even amidst the most minute objects of His marvellous creation. Contribute to the utmost of your power to maintain and uphold that order; it is not merely wise, but pious to do so!

Feed and protect these birds; they will enliven your courtyards and gardens; they will come to you in full confidence, and await the crumbs distributed by your hands; they will build nests in your bushes and amuse you by their ceaseless activity and solicitude for their young; they will charm your ears with their mellifluous songs of joy and gratitude; and if throughout the land they find both protection and comfort, they will largely and in a most striking manner requite the benefits received by proving themselves to be the most faithful protectors of your fields and woods, orchards and gardens, and of cultivation in general.

Victoria Terrace, Headingley.

NOTICE OF A NEW SPECIES OF *GRIMMIA* FOUND IN PERTHSHIRE, BY DR. F. B. WHITE.

By W. Wilson.

Grimmia subsquarrosa, *Wils., MSS.*

Dioicous—Stems loosely tufted, dichotomous—Leaves spreading and recurved, lanceolate, acute, hair-tipped, keeled, margin thickened and reflexed areolæ quadrate, enlarged at the base.

Hab. Hill of Moncrieff and Hill of Kinnoul, near Perth. May 1865—(barren). *Dr. F. Buchanan White.*

Very nearly allied to *G. alpestris*, but different in the form, direction and texture of the leaves, which are composed of a single layer of cellules, except at the thickened margin.

Another species of *Grimmia*, new to Britain, viz. :—*G. commutata*, has been found on the Hill of Moncrieff, (barren) by Dr. James Stirton, of Glasgow, July 1864, and since on Stenton Rock, with fruit, by Dr. F. B. White, December 1865. It is allied to *G. ovata*, but differs in the channelled leaves, not reflexed in the margin, and in the dioicous inflorescence.

March 21st, 1866.

NOTE ON *GRIMMIA EUGYRIA.*

Referring to the notice of this species in the *Naturalist* p. 329, I have a letter from Mr. W. Wilson, in which he informs me that by further examination he has now convinced himself that the species found at Stenton Rock is only a singular form of *G. ovata*, and is certainly not essentially distinct from that species. Specimens have been sent by Mr. Wilson to Dr. Schimper, which will receive his attention when he comes to consider the genus *Grimmia*, in writing out his forthcoming supplement to the "Bryologia Europæa."—Chas. P. Hobkirk, *Huddersfield, 23rd March*, 1866.

Reports of Societies.

High Wycombe Natural History Society. The third evening meeting of this society was held on Friday, Feb. 9th, at the house of the President, the Rev. T. H. Browne, F.G.S. As usual the members partook of tea at six o'clock, and then proceeded to view the objects laid out for them. Most of these had been lent by the President from his magnificent collection; among them were some very fine fossils from the Greensand and Tertiary formations, consisting of nautili, ammonites, fishes, sponges, &c., with elephant bones and teeth, a collection of British beetles, and British bees with their allies; and a large number of microscopical objects. The following stuffed birds were exhibited:—Spotted Crake, *Crex porzana*, that had killed itself by flying against the telegraph wires in the neighbourhood; Lapwing, *Vanella cristatus*, shot on Amersham Hill; Teal, *Anas crecca*, shot at Penn; Stormy Petrel, *Thalassidroma procellaria*, and Spotted Woodpecker, *Picus major*. The Crake is in the possession of A. Lucas, Esq., and was lent to F. Wheeler, Esq., for the evening; the Petrel and Woodpecker were exhibited by Dr. Bowstead, who also brought a specimen of the caterpillar of the New Zealand Swift, *Hepialus virescens*, remarkable for the curious fungoid growth upon it, giving it the appearance of having a very long tail. Miss Chandler sent the local species of *Labiatæ* and *Primulaceæ*, which were much admired. W. R. Tate, Esq., of London, had promised to come and read a paper on British Reptiles, and the members were greatly disappointed to find that he was not present, the secretary having only that morning received a letter from him apologising for his inabilty to attend, but promising to do so at a future meeting. As it was too late to ask any other gentleman to prepare a paper, the Secretary had put together a few notes that he had by him on the Reasoning Faculties of Animals, and the President now called upon him to read these. The question, which evidently was not a new one to the majority of the members present, was afterwards warmly discussed, and the balance of opinion was decidedly on the affirmative side. The microscope occupied the attention of the members for the rest of the evening, and a vote of thanks having been accorded to the President and the writer of the paper, the meeting broke up. It may be said to have been the most successful meeting the society has had.

Todmorden Botanical Society.—Meeting, Monday, Feb. 19., the president in the chair.—This, the first of the intermediate series, was well attended, and was inaugurated by an address from the president. All the society's officers mustered on the occasion, with the exception of Mr. Patman, the annalist, who was prevented attending by an unfortunate, but happily not serious accident on the railway. After the drawing up of certain necessary rules, the president proceeded to address the meeting. The address may be summarised as follows: Men of science, technically so called, were men who, above all others, sought to arrive at truth; sought to come to an exact knowledge of the things around them. With that object their society had been formed, with that object the present meeting was held. It was not through any stirrings of ambition, or any motives of personal aggrandisement on the part of members that the present series of meetings had been instituted. It was sought, only to give fuller opportunity and facility for the interchange of ideas and observations, among the members, on botanical, horticultural, and cognate subjects. He had confidant hopes that this interchange would always be made in the spirit of courtesy. He thought it the duty of every member of a society to try and contribute his quota of knowledge or observation for the general benefit of the society with which he was connected. Mr. Abraham Stansfield, jun., on being called upon to

read the first paper, thought it would have been more fitting had the president addressed himself to some gentleman nearer the chair. He regretted, and the regret was unaffected, that the duty of taking the initiative had been imposed upon him. At the same time, few, perhaps, could have a more earnest desire to acquaint themselves with the character and mode of operation of natural phenomena, under some particular aspects of nature, than himself. In a certain work, a translation of a portion of which he had had the honour of reading before them, some time previously, the author, an enthusiastic German, had stated that "plants when they receive at the roots an ample supply of moisture, do not, simultaneously, absorb water, in any form, through the stems and leaves." In consequence of haste at the time, the opportunity had not been given him of fairly stating his author's position, and much misapprehension had resulted. The speaker afterwards proceeded to give a *résumé* of a paper lately read before the Imperial Academy of Sciences of Vienna by the celebrated Unger, in which the learned professor demonstrates, by a series of careful and elaborate experiments, the fact that the vegetative forces acting at the roots of a plant act simultaneously in the stems and leaves. In short it must not be attempted to localise, so to speak, the functions of a plant. No one has more strenuously endeavoured to show the fallacy of localising any one function than Schultz. See his interesting work ; *Die Anaphytose, oder Verjungung der Pflanzen*, published many years ago. Closer observation and a lenghtened experience have led Herr Unger to revise his earlier opinions on the above subject ; but "science," as says an eminent countryman of the Professor's "science,—knowledge, is no ready-made building, but a tree, ever growing and renewing itself." An instructive discussion followed the reading of the above paper. The president subsequently explained, for the information of the younger members, the properties of endosmose and exosmose, and capillary attraction, to which reference had been made during the evening. At the next intermediate meeting March 19th, the vice-president, Mr. John Nowell, will read a paper on "the Mosses of the District." A more competent person for such a subject could scarcely be named. A cordial vote of thanks to the reader of the paper named above closed one of the most interesting and instructive meetings which the society, hitherto, has held.

Meeting, Monday, March 5th, the vice-president in the chair, Messrs. E. Cunliffe, Hawksclough, and J. Robertshaw, Hebden-bridge, were elected members. After the transaction of the routine business, the excursions for the approaching season were fixed as follows : 1866 — March 31st, Staups Clough, near Todmorden ; April 28th, Shedden Clough, near Burnley ; May 26th, Cowpe and Lench, Rossendale ; June 30th, Teesdale, Yorkshire and Durham ; July 28th, Thieveley Scouts, Holmes-chapel ; August 25th, Bolton Woods, Yorkshire ; September 29th, High Green-wood, near Heptonstall ; October 27th, Ramsden Clough, Walsden. The excursions, it appears, are all fixed for Saturdays, in order, we presume, to meet *everybody's* convenience. An interesting subject of conversation during the evening was the dry rot, *Merulius lachrymans*, of which splendid specimens were found no farther off than the bar of the White Hart Hotel itself, in massive red-deal posts there, put in two or three years ago ! Many antidotes have been prescribed, by *as many* men, for this troublesome *fungus*, whose specific *lachrymans*, is no misnomer ! but the best antidote of all, we are told, is—prevention—by affording a free circulation of air beneath the base timbers. Mr. Holmes had many interesting objects to exhibit under the society's microscope. Amongst others examples of *Trichina spiralis*, from diseased pork.

The Queckett Microscopical Club.—The monthly meeting of this society was held

by permission of the Council, at University College, Gower-Street, on the 23rd ultimo, a removal from Sackville-Street, to more commodious rooms having become necessary from the rapidly increasing number of its members. Mr. M. C. Cooke, (V.P.) who, in the unavoidable absence of Dr. Lankester (President) occupied the chair, read a paper on "Universal Microscopical Admeasurement," the object of which was the advocacy of the universal adoption of the French measurement, with the "millimetre" as the standard, for microscopic objects. A discussion ensued, after which the proceedings terminated with a conversazione. Eight members were elected, and seven candidates were proposed.

Norwich Naturalists' Society.—The usual meeting of the above society took place on Monday, March 5th, in the rooms, Surrey Mews. Mr. I. S. Sayer, the president, occupied the chair. The Hon. Sec. Mr. T. E. Gunn read a paper on the mammalia of Norfolk, giving an account of the recent occurrences of various species, and noticing the different abnormal hues that are occasionally met with; the paper was illustrated by a collection of specimens, including buff, piebald and white varieties of the common brown rat; black, buff, and white varieties of the common mouse; slate and cream-coloured varieties of mole; buff, piebald and white varieties of the common rabbit; piebald and grey varieties of the common hare; and a curious ash-coloured variety of the bank-vole; also specimens of the stoat or ermine, in their summer and winter dresses, and the half-change of garb between the seasons. Mr. W. Winter read some Entomological notices, and related several instances of the superstition held by persons at the present time, respecting the "Death Watch." The secretary exhibited a collection of shells taken principally on the beach at Burnham, near Wells, in Norfolk, in December last. Thanks were accorded to the readers, and the meeting adjourned till the 19th of March.

Richmond and North Riding Naturalists' Field Club. Monthly meeting, Tuesday, March 13th. Mr. E. Wood, F.G.S., in the Chair. The President exhibited a Stone Hammer Head found near Reeth. Mr. J. M. Bradley sent for exhibition some ancient pottery ware dug up in a field near Richmond, supposed to be Roman or early British age. Mr. J. Aspdin exhibited the nest eggs of the Rock Pipit, Dipper and Blackheaded Gull. Mr. J. Stoddart exhibited a specimen of Lullagmite. The Chairman announced as donation to the Museum several specimens of, and a work on, the Lead Mines of Swaledale, by the author, Mr. L. Bradley, F.G.S. Messrs. Wilson, Oliver, Lucey, Gibson, Clark, and E. Harrison, of Richmond, were elected members of the Club.—JAMES ASPDIN, Hon. Sec.

Observations.

Variety of the Starling.—At the meeting of the Huddersfield Naturalists' Society, held on Monday, the 19th instant, Mr. John Walker, exhibited *Sturnus vulgaris*, in white plumage; this *rara avis* was found in a nest at Golcar, and was hand reared by the exhibitor. Mr. G. D. Porritt, exhibited a very early specimen of *Acherontia atropos*. Mr. W. H. Charlesworth, exhibited *Dorcus parallelopipedus*, taken from a decayed willow tree, at Wakefield.—J. TINDALL.

Notes and Queries.

On the establishment of a Rookery.—Would some of your numerous correspondents kindly advise me as to the best means of establishing a rookery? I have been trying for the last six or seven years to get the rooks to build near Woodsome Hall, but without permanent success. My first plan was to exchange Rook eggs with the Magpie; this I did several times but the fact of the Rook laying so much earlier

than the Magpie caused the eggs to be fruitless. I then exchanged six Rook eggs for the same number of those of a Carrion Crow, which resulted in the hatching of one Rook; this was fed by the old bird, and got on well. Not feeling satisfied with the one Rook, when it was about three weeks old I got three more young Rooks about the same age from Whitley Hall, and added them to my one rook, the old bird, adopted them without any apparent hesitation; encouraged with this success I got three more about the same size and put them to the others: this increased my rook family to seven, the last three were taken to similar to the others, and they all came off fine healthy birds, and continued to remain about the place during the summer and winter, but to my no small disappointment when spring came they took their departure, I have no doubt to breed and settle at some of the neighbouring rookeries. Disheartened with this failure I have not made another attempt, but if some of your correspondents would suggest a plan that would be likely to answer, I will gladly try again. Everyone who knows Woodsome and the fine timber growing about the place considers it a very fine site for a Rookery, and I know Lord Dartmouth who is the owner of the property would rejoice to see one established.—Gilbert Wilson, Woodsome, 13th March, 1866.

Exchange.

Birds' Eggs and Lepidoptera.—I have a small collection of British Birds' Eggs which I shall be glad to Exchange, for Lepidoptera: I am most in want of *Sphinges* and *Bombyces*, and if any one can fill up any of my vacancies, I shall be glad to supply him with such species of Eggs as I have. Gentlemen not hearing from me in a few days may conclude that their offers are not accepted. D. Baxendale, Akroydon, Halifax.

I have some good specimens of *Janthina communis*, and a few of *Eulima polita*, which I should be glad to exchange. I especially want some of the *Odostomiæ*, and *Mangeliæ* and small marine shells. I shall be glad to exchange lists with other collectors.—W. Hill Evans, M.D., Bradford, Yorkshire.

Original Articles.

A FLORA OF HIGH WYCOMBE.

By James Britten.

(Continued from page 325.)

Order IV.—PAPAVERACEÆ.

Papaver. *Linn.* Poppy.

† *P. Argemone*, L. Bab. 15. Cornfields and waste ground.

† *P. Rhœas*, L. Bab. 15. Cornfields, etc.

Note—A very curious variety occurred near West Wycombe, in which the calyx was persistent, and was formed of four sepals, the upper two of which were opposite, and the others at short distances down the stem; they were much larger than is usually the case, and the upper two seemed part-sepal and part-petal, being streaked with red, and in some parts of a very fine texture. The four petals were very small. A white flowered variety has also been observed.

† *P. dubium*, L. Bab. 15. Probably not unfrequent; I have identified it in two or three localities.

† *P. Lecoqii*, Lamot. Bab. 15. Cornfields and banks, frequent.

‡ *P. somniferum*, L. White Poppy. Bab. 16. By the railway at the foot of Castle Hill, and in other places; *Mr. T. P. Lucas.*

CHELIDONIUM. *Linn.* Celandine.

† *C. majus*, L. Bab. 16. Hedgebanks, common, but nearly always near houses. Loudwater, Hughenden, Booker, Marlow, etc. Particularly fine in the railway cutting near Castle Hill.

NOTE—Five-petalled varieties are not uncommon. In one specimen observed, the blossom bore considerable resemblance to a *Viola*, the two upper petals being large, and the three lower, smaller.

ORDER V.—FUMARIACEÆ.

CORYDALIS. *De Cand.*

‡ *C. lutea*, DC. Yellow Fumitory. Bab. 17. Abundant on old walls and on the bridge over the Wick, in Chapel Lane, near West Wycombe; abundant by the same river at Fryer's Mill, nearer Wycombe.

FUMARIA. *Linn.* Fumitory.

F. pallidiflora, Jord. *β. Borœi*, Jord. Bab. 17. This appears to be our common *Fumaria*; it varies greatly in size and luxuriance. Cornfields, etc.,

F. officinalis, L. Bab. 18. Cornfields and waste ground.

ORDER VI.—CRUCIFERÆ.

NASTURTIUM. *R. Br.*

N. officinale, R. Br. Water Cress. Bab. 22. Ditch in Wycombe Rye; near Little Marlow; and by the Thames; not very common in a wild state, though very extensively cultivated round Wycombe, whether originally wild it would be difficult to say.

N. sylvestre, R. Br. Bab. 23. Frequent by the Thames.

N. palustre, DC. Bab. 23. Lane End Common; on banks and wet ground, Great Marlow, *Mr. J. C. Melvill*; I have not observed it about Wycombe.

BARBAREA. *R. Br.* Winter Cress.

B. vulgaris, R.Br. Bab. 23. Damp waste ground and by streams.

TURRITIS. *Linn.* Tower Cress.

T. glabra, L. Bab. 24. "In a coppice at the top of Cookham Down (Berks), extremely plentiful." *Phyt.* i. 984, *O.S.*

ARABIS. *Linn.*

A. hirsuta, R. Br. Bab. 24. Bank at the foot of Keep Hill, 1864, *Mr. T. P. Lucas !* ; not observed there in 1865 ; bank between Downley and West Wycombe, by the path above Mr. H. Wheeler's ; grassy patch on the right of the road, just past the Union, Saunderton ; "on the bank of the lane which turns off from the Little Marlow road opposite Sir G. Nugent's (now Mr. Ellames'), about two miles up the lane, sparingly." *Phyt.* i. 984. *O.S.*

CARDAMINE. *Linn.* Bitter Cress.

C. sylvatica, Link. Bab. 25. Waste ground, etc.

C. hirsuta, L. Bab. 25. Dry banks and waste ground.

C. pratensis, L. Cuckoo-flower, Lady's Smock, Bab. 25. In damp places.

NOTE—A specimen rooting at the base of each leaflet, and commencing to throw up leaves, has been observed in Wycombe Park.

C. amara, L. Bab. 25. Marshy ground by the Thames, near Little Marlow, Cookham, etc.

DENTARIA. *Linn.* Coral-root.

D. bulbifera, L. Rare. Bab. 25. Common enough in our woods, and very ornamental. Fennell's Wood ; Dane Garden Wood ; Wycombe Park ; Oakridge Wood ; Booker Woods ; Bradenham Woods ; Wood at Kingshill ; etc.

HESPERIS. *Linn.* Dame's Violet.

‡ *H. matronalis*, L. Bab. 26. Waste ground in a little field near the Loudwater Chapel.

[*Malcolmia maritima*, R. Br., the "Virginia Stock" of gardens was found in 1864 by Mr. Melvill, growing sparingly near a public house on the road from Marlow to Wycombe.]

SISYMBRIUM. *Linn.*

S. officinale, Scop. Hedge Mustard. Bab. 26. Hedgebanks and roadsides.

S. thaliana, Gaud. Thale Cress. Bab. 26. Cornfields and roadsides.

ALLIARIA. *Adans.* Garlick Mustard.

A. officinalis, Andrz. Bab. 27. Hedgebanks and near streams.

ERYSIMUM. *Linn.* Worm-seed.

E. cheiranthoides, L. "Rare." Bab. 27. Waste ground in the brickfield, Great Marlow, plentiful ; occasionally on waste ground and in fields about Wycombe, but rare.

BRASSICA. *Linn.* Cabbage.

B. campestris, L. Bab. 27. Very common by the Thames.

‡ *B. napus*, L. Rape or Coleseed. Bab. 27. Borders of fields.

SINAPIS. *Linn.* Mustard.

S. nigra, L. "Not common." Bab. 28. Waste ground above the railway, and in the Rye, Wycombe; in fields on the Marlow road; by the Thames near Bisham, Berks.

S. arvensis, L. Cherlock. Bab. 28. Cornfields, but sparingly throughout the district.

S. alba, L. Bab. 28. Fields and roadsides, very common, replacing *S. arvensis*.

ALYSSUM. *Linn.*

‡ *A. calycinum*, L. Bab. 29. In two fallow fields near Little Marlow, extremely plentiful; equally abundant in two fields "one of clover and the other of rye-grass" between Cook's Hall Farm and West Wycombe.

NOTE—The flower heads, when young, resemble in appearance those of a *Filago*.

DRABA. *Linn.* Whitlow-Grass.

D. verna, L. Bab. 30. On walls, but more frequently in corn fields, where it grows to a large size, and assumes a very different appearance.

ARMORACIA. *Rupp.*

‡ *A. rusticana*, Rupp. Horse Radish. Bab. 30. Waste ground, frequent in most parts of the district; well established in some places on the banks of the Thames.

A. amphibia, Koch. Great Yellow Cress. Bab. 31. In Wycombe Rye, and abundantly by the Thames.

CAMELINA. *Crantz.* Gold of Pleasure.

* *C. fœtida*, Fr. Bab. 31. Two or three specimens in a fallow field near Little Marlow, with *Alyssum calycinum*.

THLASPI. *Linn.* Penny Cress.

T. arvense, L. Bab. 31. Corn fields and waste ground about Great and Little Marlow, frequent; not common about Wycombe, but occurring occasionally on waste ground.

IBERIS. *Linn.* Candy-tuft.

I. amara, L. Bab. 32. Extremely common in cornfields throughout the the district, sometimes growing to a very large size.

[*I. umbellata*, L. Has occurred in Hughenden Woods; on waste ground near Little Marlow, *Miss Chandler*; and in a cornfield near North Dean, *Dr. Bowstead*.]

LEPIDIUM. *Linn.* Pepperwort.

L. campestre, R. Br. Bab. 32. "I believe this occurs in various stubble fields about Loudwater." MS. I have not noticed it in the district.

[*L. sativum*, L. Garden Cress. Bab. 33. Rubbish-heaps near the mill at Marsh Green, 1865.]

CAPSELLA. *Vent.* Shepherd's Purse.

C. Bursa-Pastoris, DC. Bab. 33. A common weed.

SENEBIERA. *Pers.*

S. coronopus, Poiret. Swine's Cress. Bab. 34. Not uncommon on waste ground.

ISATIS. *Linn.* Woad.

* *I. tinctoria*, L. "Rare." Bab. 34. A fine plant (1865), near the railway, near Bird in Hand.

RAPHANUS. *Linn.* Radish.

R. Raphanistrum, L. "White Cherlock." Bab. 35. Cornfields and waste ground, common.

ORDER VII—RESEDACEÆ.

RESEDA. *Linn.*

R. lutea, L. Wild Mignonette. Bab. 35. Railway banks, hedgebanks, and cloverfields, frequent.

R. luteola, L. Weld. Bab. 36. Chalkpits and waste ground, less common than *R. lutea*. Near Marlow, etc.

ORDER VIII—CISTACEÆ.

HELIANTHEMUM. *Gaert.* Rock Rose.

H. vulgare, Gaert. Bab. 37. Commons and hedgebanks.

NOTE—Occasionally varies with white flowers.

ORDER IX—VIOLACEÆ.

VIOLA. *Linn.* Violet.

V. odorata, L. Sweet Violet. Bab. 37. Banks, common. In some places the white-flowered variety (*V. alba*) is the more common form.

NOTE—A very pretty variety occurred near Little Marlow, having white petals, tipped with purple; and specimens, the petals of which are purple at the back, and white in front, are by no means uncommon.

V. hirta, L. Bab. 38. Hedgebanks, frequent.

NOTE—Mr. Bentham thinks this "most probably a mere variety" of *V. odorata*.

V. sylvatica, Fries. β *V. Riviniana*, R. Bab. 38. Banks and woods, common. The form *V. Reichenbachiana*, Bor., probably also occurs, but I do not remember to have seen it,

NOTE—This species produces petal-less blossoms late in the season. Both it and the next species are indiscriminately termed "Dog Violet."

V. canina, L. *V. flavicornis*, Sm. Bab. 38. On commons; Keep Hill, Totteridge Common, etc.

V. tricolor, L. Pansy. Bab. 39. Cornfields; but rarely occurring with *three-coloured* blossoms.

NOTE—I cannot well distinguish *V. arvensis*, Murr. from *V. tricolor*, but believe the former to be our common form; having yellow and white flowers, which are frequently as large as those of the true *V. tricolor*. The small-petalled form of *V. arvensis* is also frequent, as are others with petals gradually increasing in size until they attain the dimensions, though not the colours, of *V. tricolor*.

ORDER XI—POLYGALACEÆ.

POLYGALA. *Linn.* Milkwort.

P. vulgaris, L. Bab. 41. Woods, banks, and borders of fields; very fine along the terraces in the Hughenden Woods.

β *P. depressa*, Weihe. Commons and heathy places; Keep Hill, etc.

NOTE—The blossoms of *P. vulgaris* are rarely white, while those of *P. depressa* are frequently so.

ORDER XIV—CARYOPHYLLACEÆ.

DIANTHUS. *Linn.* Pink.

D. Armeria, L. Deptford Pink. "Rare." Bab. 45. "By the Little Marlow Road, by Sir G. Nugent's," (now Mr. Ellames') *Phyt.* i. 984, *O.S.* I have not been able to find it.

SILENE. *Linn.*

S. inflata, Linn. Bladder Campion. Bab. 47. Fields and roadsides. The variety β. *hirsuta*, occurs on the railway bank near Fennell's Wood.

NOTE.—The calyces are occasionally so much enlarged as to conceal the blossoms.

† *S. noctiflora*, L. "Rare." Bab. 47. Abundant in a cornfield, near the river near Great Marlow, and between that place and Little Marlow; also in an adjoining clover field. A fine plant by the roadside near Fryer's Mill, Wycombe, 1864.

LYCHNIS. *Linn.*

L. Flos-cuculi, L. Ragged Robin. Bab. 48. Marshy places, and, like them, somewhat unfrequent about Wycombe.

L. vespertina, Sibth. White Campion. Bab. 49. Cornfields and roadsides.

NOTE.—This has occurred in two or three places, bearing *bright pink* blossoms.

L. diurna, L. Red Campion. Bab. 49. Occurs in Mr. Mill's Marlow list. I have not observed it in any part of the district.

† *L. Githago*, Lam. Corn Cockle. Bab. 49. Corn and clover fields.

SAGINA. *Linn.* Pearlwort.

S. procumbens, L. Bab. 49. Walls and damp waste ground.

S. apetala, L. Bab. 50. Fern field, Well End.

NOTE.—I think *S. subulata*, Wimm., also occurs in this locality, but am not sure.

S. nodosa, E. Meyer, Bab. 51. "Winter Hill and Cookham Down," Berks. *Phyt.* i. 984. *O.S.*

ALSINE. *Wahl.*

A. tenuifolia, Wahl. "Rare." Bab. 52. Cloverfield near Abbey Barn, through which the footpath runs to Flackwell Heath, abundant; wall at Little Marlow, opposite the Church; wall by Mr. Wingrove's Farm, Hazlemoor.

ARENARIA. *Linn.*

A. trinervis, L. Bab. 52. Woods and hedgebanks.

A. serpyllifolia, L. Bab. 53. Walls, frequent.

A. leptoclados, Guss. Bab. 53. Cornfields and waste ground.

NOTE.—Except in situation, I can discover but little difference between these two species.

STELLARIA. *Linn.* Stitchwort.

S. media, With. Chickweed. Bab. 54. Fields and waste ground.
γ *S. neglecta*, Weihe, occasionally occurs. Hughenden Park, etc.

S. Holostea, L. Bab. 54. Hedgebanks and woods.

S. glauca, With. "Rather rare." Bab. 54. In damp meadows about Marlow, frequent; in a damp meadow adjoining Cock Marsh, and by a ditch near Bisham Wood, Berks.

S. graminea, L. Bab. 54. Heathy places, and by roadsides.

S. uliginosa, Murr. Bab. 55. Damp places, not very common; Hughenden Park; Wycombe Rye; Newland, etc.

MALACHIUM. *Fries.* Water Chickweed.

M. aquaticum, Fr. Bab. 55. By the Thames, and by ditches about Marlow; also by the Wick.

CERASTIUM. *Linn.* Mouse-ear.

C. glomeratum, Thuil. Bab. 55. Dry fields and by roadsides.

C. triviale, Link. Bab. 56. Fields, roadsides, and waste ground.

C. semidecandrum, L. Bab. 56. In dry places; Fernfield, etc.

MŒNCHIA. *Ehrh.*

M. erecta, Sm. Bab. 57. Fernfield, Well End; Wheeler End Common.

Order XV—MALVACEÆ.

Malva. *Linn.* Mallow.

M. moschata, L. Musk Mallow. Bab. 58. Roadsides and borders of fields, not very common.

M. sylvestris, L. Bab. 58. Roadsides and waste places.

M. rotundifolia, L. Bab, 58. Roadsides and by walls.

Order XVI—TILIACEÆ.

Tilia. *Linn.* Lime.

* *T. grandifolia*, Ehrh. Bab. 59. Occurs in Wycombe Park, and occasionally in other places, but is nowhere native.

Order XVII—HYPERICACEÆ.

Hypericum. *Linn.* S. John's Wort.

‡ *H. calycinum*, L. In the shrubbery at Hughenden, where *Helleborus fœtidus*, grows. Mr. Ullyett thinks that he has seen it in Whittington Park.

H. Androsæmum, L. Tutsan. Bab. 60. In woods, not uncommon. Fennel's Wood; Dane Garden Wood; Wood near Winch Bottom; West Wycombe Woods; Cook's Hall Woods; Wood near Stone Warren; Great Missenden Wood; etc. "At the top of Bisham Wood," Berks. *Phyt.* i. 985. *O. S.*

Note.—"Touch-and-heal" is the local name of this species.

H. quadrangulum, L. Bab. 61. By ditch sides, Wycombe; and by the Thames, abundant.

H. perforatum, L. Bab. 61. Hedgebanks, common.

Note.—The form *H. lincolatum*, Jord. having black lines at the back of each petal, is almost equally common with the typical species.

H. humifusum, L. Bab. 61. Commons and roadsides. Lane End Common; Fernfield; Wycombe Heath; Naphill Common, etc.

H. hirsutum, L. Bab. 62. Woods and hedgebanks.

H. montanum, L. Bab. 62. Not very uncommon in woods, and occasionally by roadsides. Hughenden Wood; small wood on Bledlow Ridge; Winch Woods; Wood at Lane End; roadside between Wycombe and Marlow; "Woods south east of Marlow Common," *Phyt.* i. 985. *O. S.* Bisham wood, Berks.

H. pulchrum, L. Bab. 62. Banks, commons, and occasionally in woods; not very common.

H. elodes, L. Bab 62. "I was informed that [it] usually occurred" in a marsh at Lane End, "but it has disappeared this year [1864], owing to the want of moisture." Mr. J. C. Melvill, in *Naturalist* i. 155.

Order XVIII.—ACERACEÆ.

Acer. *Linn.* Maple.

A. campestre, L. Bab. 63. Hedges, frequent; occasionally attaining the size of a tree.

‡ *A. pseudo-Platanus*, L. Sycamore. Bab. 63. In plantations, and occasionally in hedges.

Order XIX—GERANIACEÆ.

Geranium. *Linn.* Crane'sbill.

‡ *G. phæum*, L. Bab. 63. "In a ditch along by the side of the railway by the edge of Fennell's Wood, above what was Mr. Musgrave's (now Mr. Hennell's) orchard or fields, at Loudwater." *MS.*

G. pratense, L. Blue Cranesbill. Bab. 64. Plentiful by the Thames; meadow at Bradenham, *Mr. Kennedy.*

† *G. sanguineum*, L. "Rare." Bab. 64. Railway embankment between High Wycombe and the Marsh, several plants.

G. pyrenaicum, L. "Rare." Bab. 64. By the London road, near Little London; also by the same road, about half-a-mile below the Marsh, *Mr. T. P. Lucas!*; occurs, without locality, in Mr. Mill's Marlow list, *Phyt.* i. 986. *O.S.*

G. pusillum, L. Bab. 65. Cloverfields, roadsides, and waste ground, frequent.

G. dissectum, L. Bab. 65. Roadsides and borders of fields.

G. columbinum, L. Bab. 65. On banks and among clover, not uncommon. About West Wycombe, Totteridge, Forty Green, Marlow, etc. Mr. Melvill records it from Bisham, Berks.

[*G. rotundifolium*, L. This occurs in the Loudwater list, as having been observed by the high road between Loudwater and Wycombe; but as some little doubt is expressed, the species there noticed may have been *G. pusillum.*]

G. molle, L. Dovesfoot. Bab. 65. Banks and fields.

Note.—White-flowered varieties are frequent.

G. lucidum, L. Bab. 65. Hedgebanks, somewhat frequent. Lane by Fernfield, Well End; and by Mount Pleasant at Flackwell Heath, abundant;

more sparingly on a bank near the railway, on the London road, a little above the first arch.

G. Robertianum, L. Herb Robert. Bab. 66. Woods and hedgebanks.

ERODIUM. *L'Hérit.* Stork'sbill.

E. cicutarium, Sm. Bab. 66. Waste ground, as Fernfield; also frequently in cloverfields, where it attains a large size.

ORDER XX—LINACEÆ.

LINUM. *Linn.* Flax.

* *L. usitatissimum*, L. Bab. 67. In cornfields, but nowhere constant. Near the Union House, Saunderton; near the obelisk, Hughenden, *Miss Chandler.*

L. catharticum, L. Bab. 67. Commons, roadsides, and dry pastures.

ADDITIONS TO ROWE'S CATALOGUE OF THE MAMMALS, BIRDS, &c.. OF DEVON.

BY G. F. MATHEW, R.N., F.L.S., &c.

In 1863, "A catalogue of the Mammals, Birds, Reptiles, and Amphibians, indigenous to, or observed in the county of Devon," was published by Van Voorst. Its author, J. Brooking Rowe, Esq., F.L.S., of Plymouth, is a gentleman well known in scientific circles, as one who has been, and still is, working hard at the Natural History of Devon. However, in this catalogue, which no doubt many of your readers have seen, several birds that have occurred in the northern division of the county are omitted, and other species which appear to be rare in the south are met with more frequently in the north, so perhaps, a list of these birds may not prove altogether uninteresting to the ornithological portion of your readers.

SPOTTED EAGLE, *Aquila nævia*, Briss. I think it but right to state that this extremely rare bird, which was recorded in *Zoologist*, p. 7380, as having been shot by Mr. Heaven, on Lundy island, fell over the cliffs and was never obtained. It was only by collecting a few of the feathers which were blown inland that the species was determined.

WRYNECK, *Yunx torquilla*, Linn. The latter end of August, or the beginning of September 1858, I shot a young example of this species as it flew from an elm tree. It had been but a few days from the nest, as the greater part of its feathers were tipped with down.

Lesser Spotted Woodpecker, *Picus minor*, Linn. I have noticed this bird on several occasions near Barnstaple, and many specimens have been shot.

Pied Flycatcher, *Muscicapa atricapilla*, Linn. Mr. Rowe mentions but two instances of its occurrence in Devon ; near Barnstaple, however, it appears to be more frequent as in the autumn of 1857, two of my brothers, discovered a flock of this pretty species flitting about a hedge, bordering a marshy spot close to the town. Three or four of them were shot, but were all birds of the year. Next spring many old birds were seen in the same place. My brother, the Rev. Murray A. Mathew, has also observed the old birds haunting some low bushes in the vicinity of a boggy part of Huish Down, near Combmartin, and where he says, he believes they breed.

Red Backed Shrike, *Lanius collurio*, Linn. Appears to be more numerous in the northern division of the county than in the south.

Black Redstart, *Sylvia tithys*. Temm. But a solitary instance of the occurrence of this bird near Barnstaple has come to my knowledge—and that was noticed by the Rev. W. S. Hore, in the town itself.

Nightingale, *Lusciola luscinia*, Linn. It has been said that this bird has been heard in full song late in the evening, in a grove, close to the town, but as the bird itself was not seen, I am inclined to believe that a Blackcap was the charming songster which enraptured the ears of the "Barumites," a few years ago.—In my opinion this bird is only second to the Nightingale.

Whinchat, *Saxicola rubetra*, Linn. This species is not common in the north of Devon.

Lesser Whitethroat, *Sylvia curruca*, Lath. I have repeatedly seen this bird and taken its nest, and do not call it uncommon in the neighbourhood of Barnstaple.

Richard's Pipit, *Anthus Richardi*, Vieill. I had the good fortune to shoot an example of this rare bird on Braunton Burrows, in December, 1864, for an account of which, vide *Zoologist* for February 1865.

Snow Bunting, *Emberiza nivalis*, Linn. I met with a large flock of these pretty birds feeding in a stubble field early in the autumn of 1863, between Barnstaple and Ilfracombe, and three of them in different stages of plumage were killed at a single shot. Vide *Zoologist*, for 1863.

Common Crossbill, *Loxia curvirostra*, Linn. A flock of these birds visited some large fir trees in our lawn, several years ago, and many of them were shot. One bird I recollect was wounded and fell between a forked

branch where it remained until pushed down with a long stick. While it was in this position one of its companions remained close at hand and at the approach of the stick, made furious bites at it, as if to defend its wounded friend, and indeed so eager was it in its attack that it actually clung to the stick and was nearly captured with its more unfortunate companion.

Rose-coloured Pastor, *Pastor roseus*, Briss. Has occurred within the last few years on Lundy island.

Golden Oriole, *Oriolus galbula*, Linn. This species has been known to breed near Barnstaple. A pair frequented for several seasons the gardens of my late friend, J. R. Griffiths, Esq., of Pilton Abbey, Vide *Ibis*, 1865. page 20.

Chough, *Fregilus graculus*, Linn. This species is still to be seen in some numbers in certain localities on the north coast. My father killed three at a shot on Braunton Burrows some years ago. It does not however appear to be so frequent as it was formerly.

Hooded Crow, *Corvus cornix*, Linn. Not uncommon. A few years ago I frequently saw an example of this species far inland in company with the common *C. corone*, and I have every reason to believe that the pair had mated.

Pallas' Sand Grouse, *Syrrhaptes paradoxus*, Pall. One was shot near Heanton Court on 11th of December, 1863, as recorded in *Zoologist*, 1864, page 8958.

Black Grouse, *Tetrao tetrix*, Linn. This bird is still shot every year, on Exmoor where it does not seem to be very scarce.

Cream-coloured Courser, *Cursorius isabellinus*, Mey. A specimen of this very rare bird was shot by the Rev. J. Landon, of Braunton, early in the last week of October, 1856, vide *Zoologist*, 1857, page 5346. I had the pleasure of seeing it in the flesh. I afterwards saw a pair in the same locality (Braunton Burrows), as recorded in the *Zoologist*, for 1860, page 6980, but did not succeed in obtaining a shot at them, although I waited for some time in the hopes of doing so.

Little Ringed Plover, *Charadrius minor*, Mey. This bird was shot on the banks of the Taw, in September, 1859, by one of my brothers, vide *Zoologist*, page 6762, and I believe I saw a pair in the same locality as recently as April 1865.

Avocet, *Recurvirostra avocetta*, Linn. This beautiful bird has occurred on the banks of the Taw and Torridge, on one or two occasions.

Wood Sandpiper, *Totanus glareola*, Linn. The only example of this

rare bird which has occurred in the neighbourhood of Barnstaple, was shot by my late lamented brother, Walter H. Mathew, Esq., on the banks of the Taw, in 1859.

Black-tailed Godwit, *Limosa melanura*, Leisl. I shot a very good specimen of this bird on the banks of the Taw, in the autumn of 1859. I am not aware that it has been shot before in the north of Devon.

Ruff, *Machetes pugnax*, Cuv. Has been shot near Barnstaple and near Clovelly, and an immature bird was killed by my brother, the Rev. M. A. Mathew, as recently as September, 1865.

Heron, *Ardea cinerea*, Lath. In addition to the heronries named by Mr. Rowe, I may mention those of Fremington and Arlington near Barnstaple.

Egyptian Goose, *Anser Ægyptiacus*, Jenyns. Has been shot on two occasions on the Taw, one out of a flock in May 1865. I believe all the examples of this species which have been recorded as shot in England, would prove if properly traced to have straggled from some ornamental water. On a piece of water near Crediton some years ago, and possibly now, there used to be a large flock of these birds, and I have often seen them miles from their home—sometimes two or three together, and at other times nearly the whole flock. They preferred to stray after heavy rains and might then be seen feeding in low meadows.

Roseate Tern, *Sterna Dougallii*, Mont. This beautiful bird was shot in September, 1859, vide *Zoologist*, 6761. The lovely rosy tint soon fades after death.

Gullbilled Tern, *Sterna anglica*, Mon. An immature example of this rare bird was also shot by my brother, the Rev. M. A. Mathew, in September 1859, and recorded in *Zoologist*, page 6761.

Sabine's Gull, *Larus Sabini*, Sab. A specimen of this rare bird in the collection of Cecil Smith, Esq., of Bishop's Lydiard, Somerset, was shot by his father in south Devon, some years ago.

Sclavonian Grebe, *Podiceps cornutus*, Lath. Has been killed by my father, near Barnstaple.

Eared Grebe, *Podiceps auritus*, Lath. A fine mature example shot on the Taw, in April, 1865, is now in my collection.

H.M.S. Terrible, Malta, 10th March, 1866.

RICHMOND AND NORTH RIDING NATURALISTS' FIELD CLUB.

Probably it will not be uninteresting to some of your readers to see as shewn by the accompanying table the quantity of Game and Wild fowl killed on the Hornby Estate, near Catterick, between September 1st 1856, and August 31st 1864.

The table was given me by Mr. A. Savage, the head keeper, who is a most keen and observant Naturalist, and who has during the past few years been the means of adding considerably to the list of birds breeding in the neighbourhood by his careful observation.

GAME AND WILD FOWL KILLED ON THE HORNBY ESTATE, NEAR CATTERICK, YORKSHIRE.

From September 1st, 1856, to August 31st, 1864.

PERIOD.	Partridge.	Pheasants.	Woodcocks.	Snipe.	Hares.	Rabbits.	Wild Ducks.	Teal.	Wigeon.	Other Birds.
From Sep. 1, 1856, to Aug. 31, 1857	968	1184	8	19	1414	2368	269	43	5	2
" " 1857, " 1858	1329	1345	34	43	922	2160	52	24	6	
" " 1858, " 1859	2393	1406	11	23	1053	3046	104	12	1	
" " 1859, " 1860	5359	1787	11	15	1578	3845	403	34	2	
" " 1860, " 1861	582	53	7	9	576	2913	701	8	17	3
" " 1861, " 1862	1038	174	8	15	893	3359	959	11	30	7
" " 1862, " 1863	450	253	8	1	1185	3331	348	34	3	1
" " 1863, " 1864	487	343	18	28	1178	4617	668	45	37	5
Total.....	12606	6545	105	153	8799	25639	3504	211	101	*18

* Other Birds include Pintails, Coots, Moorhens, and three Goosanders.

JAMES ASPDIN

NOTES ON NORFOLK ENTOMOLOGY—*LEPIDOPTERA*.

By T. E. Gunn.

Part VII.

Nocturni.

Acherontia atropos, var. On the 20th of September last, I was so fortunate as to secure a curious variety of the larvæ of this species from a lad who stated it was obtained during the morning in a garden belonging to Mr. Richardson, in Mile End lane, near this city. It measured five inches in length, and was of a uniform brownish olive, assuming a yellowish hue along the surface of its back, with the exception of the second and third segments, these being white, inclining to a faint pinkish tint; down the centre on this peculiar marking, runs two streaks of dark amber which are intersected by a very narrow line of straw colour. The cross markings along the centre of its back are brown, as also are its anal claspers, the small oval dots in each of the segements at the sides are blackish brown. The pinkish oblique markings on its sides are very faint. The whole surface of the caterpillar (with the exception of the two segments previously mentioned) is densely spotted with small white dots, more particularly on its under parts. Its head is yellow streaked with several very fine lines of black. Anal horn, pale amber, feet, black. Not being able to procure the potato leaves, I gave it some of the convolvulus upon which it fed very voraciously for a few days, it then burrowed its way into the mould I had placed in the breeding cage for its reception. On the 5th of October it changed to its pupa stage from whence I had hoped the imago would emerge in due season. I was however, doomed to disappointment, as a mischievous mouse found its way into the cage and devoured it with other pupæ, leaving me the empty cases only. This variety of *Acherontia atropos*, according to Stainton's Manual of British Butterflies and Moths, is of rare occurrence, therefore, thinking that these few details may be of interest to some of your readers, I take this opportunity of recording them. My brother, Mr. W. Gunn, executed for me an accurate sketch of the above which I now have in my possession.

Geometræ.

In reply to Mr. Hammond's query, see *Naturalist*, page 240, respecting my notes on the Geometræ of the Norfolk Fens, I beg to observe that *C. munitata* and *L. salicata, were both taken* by Mr. Winter in our fens, speci-

mens of the same are now in two other collections besides his own. *P. trepidaria* and *lapidata*, were accidentally included, and may be erased. *Ericelata* is found sparingly at Herringfleet, and all over the heaths from there to Yarmouth, the late Messrs. Curtis, Wigham and Sparshall used to visit Herringfleet, (a favourite hunting ground of theirs,) the latter in whose collection it was, but I cannot be certain if he took it there. Many of the food plants of northern and mountain species, such as various mosses, hepaticæ, Lichens, *Hypericum elodes*, *Salix*, and other species are to be found pretty abundant in our fens, therefore, *it is not improbable* for the above species to occur.

PSEUDO-BOMBYCES.

P. plumigera. Was included by mistake in my notes, see *Naturalist*, page 219.

NOCTUÆ.

Nonagria elymi. This species new to Britain was first discovered in the Norfolk Fens by Messrs. Winter and Crotch, on the 27th of June, 1861. Two of the specimens captured were exhibited at the August meeting of the Entomological Society of London. See the *Entomologist's Annual*, for 1862, page 108.

Plusia orichacea. Taken once at Aldeby, in 1849, at light, by Mr. W. Winter. The specimen is now in the collection of A. F. Sealy, Esq., at Cambridge.

DELTOIDES.

Hypena proboscidalis. Abundant everywhere.

H. rostralis. Ranworth, Mr. Winter.

H. crassalis. Ranworth, Mr. Winter.

Hypenodes albistrigalis. Not uncommon. Cawston, Ranworth, &c.

Schrankia turfosalis. Not uncommon. Cawston, Rev. T. H. Marsh.

Rivula sericealis. Ranworth, Mr. Winter.

Herminia barbalis. Not uncommon. Foulsham, Ranworth, &c.

H. tarsipennalis. Not uncommon. Cawston. Ranworth.

H. grisaelis. Not uncommon at Neatishead, Ranworth, and around Norwich. Rare at Cawston, Rev. T. H. Marsh.

H. cribralis. Ranworth, Mr. W. Winter.

AVENTIÆ.

Aventia flexula. Rare. Neatishead, Mr. I. S. Sayer, Cawston and Wood Dalling, the Rev. T. H. Marsh, and Mr. Geo. Norris.

Norwich, December, 1865.

Reports of Societies.

Wakefield Naturalists' Society.—On the 15th March, Mr. Talbot exhibited a number of beetles, among which was *Dorcus parallelopipedus*, taken from an elm, at Kirkthorpe, Wakefield, nearly a week previously. He gave a short account of its habits, and stated that many trees were being rapidly destroyed by them. On the 5th April a great variety of specimens were laid before the meeting. Mr. Oxley exhibited a number of plants in flower. Mr. Roberts laid upon the table eggs of the Common Thrush (*Turdus musicus,*) and of the Blackbird (*Turdus merula,* taken on the 18th ultimo. Mr. Talbot exhibited a number of beetles, *Synodendram cylindricum*, taken from the willow. He had also taken them from the ash. He also shewed a great number of *Coccinella* 11-*punctata*, found clustered beneath the bark of a tree. On behalf of Messrs. Hindson and Marsden, he exhibited the complete skeleton of a stoat thickly covered with feathers from the brown owl. It was taken from a hollow branch of an oak tree, at some distance from the ground. The gentlemen, above-named surmise that the owl must have carried off the stoat intending to dine off him, and that he not being a consenting party resisted, and the desperate struggle resulted in the death of agressor and victim, and thus they were found occupying one common grave.

News.

An Invasion of Frozen-out Deer—As the depth of snow deepened on the Braemar hills and upland glens, the deer with their usual precision, congregated upon the low grounds. At first, with judicious care, hay was sparingly laid out in small quantities; but owing to the uniformly increasing depth of snow during January, the gamekeepers of both Old and New Mar Lodge, with a staff of assistants, have daily been laboriously engaged in laying out large supplies of hay and other provender at convenient situations, which was greedily devoured almost as soon as given out. The starved herds in most instances followed closely in the wake of the carts of hay, several of the leading stags even becoming bold enough to snatch an occasional mouthful on the route. Perhaps the greatest difficulty experienced by the gamekeepers was in protecting the weak and young deer from the attacks of the strong stags, which in several instances boldly endeavoured to monopolise the contents of the various heaps, to the exclusion of others. In the vicinity of Old Mar Lodge, and on the Carr Hill and adjoining plateau to the east of the New Mar Lodge, the stags have herded together in fabulous numbers. In fact it would appear that the strength of both forests has gathered at these places. The proximity of such neighbours, however, has been a source of trouble and, in many instances, serious loss to the farmers, whose stackyards, and turnips in pits, and under other cover, have been boldly attacked by the prowling invaders, which, as the severity of the weather increased, have become proportionately audacious in their inroads.—*Edinburgh Evening Courant.*

The other evening, a few minutes before ten o'clock, the lioness "Alexandra," at Mander's Grand Menagerie, now exhibiting at Knot-mill fair, gave birth to nine fully-developed cubs. Such a number at one litter is unparallelled, the usual litter being from two to four. Each of these interesting little strangers represents a commercial value of £150.

Capture of a Golden Eagle.—Last week a large golden eagle was captured at South

Fallownow, near Coldingham. It measures 7 feet 11 inches from tip to tip of wing, and is in fine plumage. It was caught in an ordinary steel vermin trap by Simon Bathgate, gamekeeper to John Ramsay L'Amy, Esq., of Dunkenny.—*Edinburgh Courant.*

The Dodo.—The known remains of the dodo are but few, but the hypotheses built on what few relics have been discovered are many, and in some degree various. The investigations of Messrs. Strickland and Melville proved that the bird really was a gigantic ground pigeon, doubtless feeding its young with the milky secretion of its crop, like the whole of the columbine birds of the present day. The views of Messrs. Strickland and Melville as to the structure of the dodo have been remarkably borne out by the discovery of a large number of bones of the bird in a small morass in the Mauritius, known as the "Mare aux Songes," which had been drained for agricultural purposes. These bones have been carefully examined, and an elaborate and very valuable paper, descriptive of the osteology of the animal was recently read before the Zoological Society by Professor Owen. In addition to a complete set of the bones retained for the national collection in the British Museum, a considerable number of duplicates have been obtained. These were sold by auction by Messrs. Stevens, of London, on Tuesday. They were arranged in eight lots so as to make each one as complete as possible. The lots were contested for with much spirit, by a numerous assemblage of scientific gentlemen, several of whom were connected with the natural history departments of the British and Continental museums, and the collection eventually realised the sum of £83.—*Manchester Examiner and Times.*

Observations.

Lanius excubitor.—A fine specimen of the Great Grey Shrike, *Lanius excubitor*, in full plumage, was killed on Lord Lilford's estate, Bank Hall, in this county, on the 12th of February, and was forwarded to Thomas Jones, of Church, for preservation, upon dissecting it, it proved to be a female bird.—SYDNEY SMITH.

Supposed Variety of the Spotted Woodpecker (Picus major).—I have long been puzzled by a singular example of this bird, which I shot in this island (Unst), in the autumn of 1851. Perhaps some reader of the *Naturalist* will oblige me with his opinion. The specimen in question has the crown of the head red, slightly spotted with black, and in this, as in most other points, resembles an ordinary example of the great spotted woodpecker in the plumage of its first autumn, only, the under parts are much streaked with brownish black, and the whole of the wing coverts, except those immediately above the tertials, are ash gray, with their central portions black; the rump and the nape of the neck are also of those colours.—HENRY L. SAXBY, Baltasound, Shetland, March 28, 1866.

Albino Starling.—A carpenter, named Craig, at Bigadier Hill, north of Enfield, has a stuffed white starling in his parlour which was shot at Slough, Bucks. He has also stuffed a very dark squirrel with a white tail, which he shot near his cottage. He will be glad to shew them and other stuffed creatures to anyone calling.—W. R. TATE, 4, Grove Place, Denmark Hill, London.

Fringilla spinus.—On the 2nd January, while I was out with a gun, I came across a flock of the Lesser Redpole, feeding,—and being in want of a pair for preservation, I fired at the flock, and when I went to pick up the birds I had killed, to my surprise I found that I had killed four

Siskins, *Fringilla spinus*, but owing to my shot being too large I spoiled them all ; they appear to have been very numerous in this locality, for I came across a person who showed me some that he killed behind his house, in a wood, three weeks after I killed mine ; these were amongst a flock of the Lesser Redpole, and would allow one to approach within ten yards of the tree they were in ; going through all the manœuvres of theBlue Tit. The bird appears to be almost unknown to this locality.—SYDNEY SMITH, Church, near Accrington.

Rare Eggs.—It will be interesting to ornithologists to know that I have just added the following *genuine* eggs, collected in Norfolk last season, by a gentleman, to my collection. Yellow-billed Cuckoo (*Coccyzus Americanus, Gould*), Rock Thrush (*Turdus Saxatilis, Temm.*), Little Bittern (*Ardea minuta, Mont.*), Golden Oriole (*Oriolus galbula, Pew*), Roseate Tern (*Sterna Dougalii, Gould*), Sandwich Tern(*Sterna cantiara, Gould.*)W. B. SHARPE.

Vanessa urticæ.—This beautiful though common butterfly appears to have been rather numerous during the winter months. On the 18th February, some boys followed one of these butterflies for a long distance, but unhappily it went over a wall, and was lost to sight, the ground being covered with snow at the time : also one of this species entered the door of a private house, at Blackburn, on the 7th March ; it being very cold and frosty on this date. I have also seen accounts of a butterfly occurring at Stalybridge, near Manchester, and another at Bury, which I think will be *Vanessa urticæ.*—S. SMITH.

Hypnum purum, &c.—I find in an article on "Mosses" in your last number, that *Hypnum purum* and *H. triquetrum*, are said to be rarely found in fruit in Britain, it may perhaps be interesting to know that I have found them in one of our woods near High Wycombe in fruit, and could probably do so again. *Climacium dendroides* grows in a very small patch of ground in our park ; perhaps I should say *did* grow, for though I found several specimens in 1863, I have not been able to find it since. If I am not greatly mistaken a friend of mine also found *C. splendens* and *H. squarrosum* in fruit here. *C. dendroides* was not in fruit. —HY. ULLYETT.

Vanessa cardui—was plentiful with us last autumn : I took several specimens in splendid condition, and varying much in size ; *V. atalanta* was exceedingly numerous ; it appears fond of fruit ; I have seen a dozen at a time feeding on the overripe plums on one tree. *Arge Galathea* was not at all rare in one or two localities. *Argynnis Paphia* breeds in profusion here every year, but I am afraid we shall lose *A. selene*, as Wycombe Heath is being ploughed up. (See *Naturalist*, Vol. I., p. 260). It is hardly worth while mentioning *M. stellatarum*, as all our magazines and newspapers have been full of letters about it : but I saw one flying up and down a chalk pit so late as Nov. 14th. Larvæ of *A. atropos* were unusually abundant. Among early appearances this year I noted *V. urticæ* in High Street, on New Year's Day, but I judged it to be only disturbed from its sleep in one of the houses, as it was very lazy. To the list of butterflies in Vol. I., p. 261, I must now add *Lycæna alsus* which I took here last year. It is only found on one bank, but there it sports about by hundreds. To the list of moths, in the same volume, p, 302, I can add *Chærocampa Elpenor*, several larvæ of which I found on the willow herbs in the park. HY. ULLYETT, High Wycombe.

END OF SECOND VOLUME.

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